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the telephone industry magazine

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50th ANNIVERSARY
1909 1959
THE TELEPHONE INDUSTRY MAGAZINE

V.63 #21

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FRONT COVER

A bill relating to telephone calls on party lines during emergencies was passed without opposition by the Wisconsin legislature during its 1959 session. Research on the measure was accomplished by the Wisconsin State Telephone Association in cooperation with the State Public Service Commission. The new law provides that intentional refusal to surrender use of a party line in an emergency or attempts to seize a party line on the pretext that an emergency exists are both acts which can bring fines up to $500. The law defines an emergency as a situation in which property or human life are in jeopardy and the prompt summoning of aid is essential. Every telephone directory distributed in the state is to contain a notice relating to the statute and stating in substance the conduct prohibited by it. GOVERNOR GAYLORD A. NELSON, at whose request the Bill was introduced, is shown signing it into law as F. H. SCHAFER, Clintonville, president, Wisconsin State Telephone Association, and RAY J. RIORDAN, secretary of the association, look on.

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coming CONVENTIONS

ALABAMA Tel. Association, Thomas Jefferson Hotel, Birmingham, Ala., Nov. 9-10.

GEORGIA Tel. Association, Dinkler Plaza Hotel, Atlanta, Ga., Nov. 11, 12, 1959.

OKLAHOMA Tel. Association, Skirvin Hotel, Oklahoma City, Nov. 18-19.

SOUTH DAKOTA Tel. Assoc., Marvin-Hughitt Hotel, Huron, S. D., Nov. 18-19, 1959.

FLORIDA Tel. Association, Robert Meyer Hotel, Jacksonville, Fla., Nov. 30, Dec. 1, 1959.

LOUISIANA Tel. Assoc., Jung Hotel, New Orleans, La., Feb. 24-25, 1960.

KENTUCKY Tel. Assoc., Phoenix Hotel, Lexington, Ky., March 1, 1960.

OHIO Tel. Assoc., Deshler Hilton Hotel, Columbus, Ohio, March 28-30, 1960.

IOWA Tel. Assoc., Ft. Des Moines Hotel, Des Moines, Iowa, April 5-6, 1960.

NEBRASKA Tel. Assoc., Hotel Not Announced. Omaha, Nebraska, April 19-20, 1960.

INDIANA Tel. Assoc., Claypool Hotel, Indianapolis, Indiana, May 4-5, 1960.

ILLINOIS Tel. Assoc., Abraham Lincoln Hotel, Springfield, Ill., May 19-20, 1960.

KANSAS-MISSOURI Tel. Association, Towne House, Kansas City, Mo., May 24-25, 1960.

PENNSYLVANIA Tel. Assoc., Bedford Springs Hotel, Bedford Springs, Pa., June 6-7, 1960.

CALIFORNIA Tel. Assoc., Fairmont Hotel, San Francisco, Calif., June 8-10, 1960.

WASHINGTON-OREGON Tel. Assoc., Sheraton Portland Hotel, Portland, Ore., June 16-17, 1960.

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With Stromberg-Carlson "561" Subscriber Carrier you expand service without the high cost of conventional methods. Flexibility assures quick, easy addition of service in fast-growing areas. Get full details from your Stromberg-Carlson representative.

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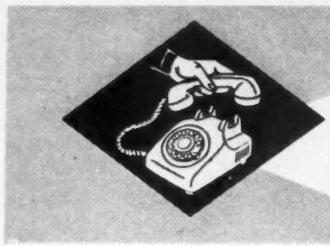


INDUSTRY OBSERVATIONS

by L. A. GRITTEN

"What Are The Wild Waves Saying?"

OUR INDUSTRY'S vigorous objections to the F.C.C. microwave decision are of course based mainly on its effect upon the operating telephone and telegraph companies. If made good, this ruling will result in a heavy loss to them. In addition, there will be (in AT&T words) — "an enormous waste of manpower, materials and frequency space, through needless duplication."

Only experts, armed to the teeth with data, are competent to say much about frequency allocations; but certainly it is obvious that future demands upon the spectrum may far outrun anyone's present ability to predict. This is not a good time to indulge in wasteful duplication of frequency allotments.

Another consideration is suggested by recent news items. At the Holloman Air Force Base in New Mexico, the "drone" planes, used as targets, suddenly began to do things they were not supposed to do, such as prematurely dropping their automatic recovery parachutes. Eventually the trouble was located. A lady dispatcher for a taxicab company in El Paso had wandered into the drone plane control frequency.

At the University of Wisconsin, scientists were trying to obtain a "fix" on the Vanguard satellite's radio signals. Instead, they listened perforce to music from a Madison F. M. station, described as "mellifluous but totally unwanted."

Much more dangerous, at Cape Canaveral the "count down" for the moon rocket was thrown off schedule a few minutes before the launching "zero." In this case a "ham" operator was gossiping off his proper frequency, serenely unaware of his interference with a vitally important experiment in space travel.

L. A. GRITTEN'S "Industry Observations" appear exclusively in "Telephone Engineer & Management."

Trouble due to maladjustment, technical incompetence, or even malicious sabotage, could be greatly increased and harder to locate, if F.C.C. throws open the door to thousands of privately-owned microwave stations. In this era of Cold War and social disturbance, the logic of the situation calls for more restrictions, not fewer. Weakened control of the electronic spectrum may be gravely dangerous.

* * *

Versatility Plus

IN AN age of rigid specialization, it is pleasant to hear of a really versatile telephone man. Meet Edward Gallacher, of Frobisher Bay, Baffin Island, Canada, now a refuelling stop for trans-Atlantic plant flights. British born, Gallacher was formerly a wing commander in the R.A.F. He flew night fighters against the Japanese. Later he flew for Maritimes Central Airways. Now, in Frobisher Bay (population 2000) he owns the local hotel and a 40-room lodge. He is postmaster. He owns the taxi service, with four taxis. He operates East Coast Carriers, Ltd., employing about 28 people. He owns the service station and the movie. He is the local appraiser for insurance companies. He is preparing to open up in the near future a flying school, a restaurant, a bowling alley and a cocktail lounge.

In his spare time he manages affairs in the Frobisher Bay area for the Canadian Bell Telephone Company.

* * *

Information Please

MANY OF THE Russian boasts are best studied through the wrong end of a telescope. Here however is a claim, probably factual, by A. I. Mikhailov, Director of the Institute of Scientific and Technical Information of the Academy of Sciences of the U.S.S.R. He says that the Institute abstracts literature received from 92 countries in 64 languages. In addition to all Soviet literature, it exploits some 11,000 non-Soviet periodicals. In addition to the Institute's regular staff, more than 20,000 editors and others assist in the abstraction of technical and scientific literature.

* * *

The Who — Whom Horror

ALL OUR LIFE we have shivered in the shadow of two pairs of words: "Will and Shall" and "Who and Whom." When perforce we have used any of them, a dreadful doubt has chilled the blood in our veins. We have longed for the carefree courage of Christopher Morley, who named his kittens "Will" and "Shall," because "Nobody can tell the difference."

At last the cloud is lifted. In I.B.M.'s THINK, Bergen Evans ("Your Speech is Changing") tells us in effect that it doesn't matter and we don't have to worry. In the future, we may say "Who did you give it to?" without caring; what is more, we can put it in writing and dare the proofreader to "whom" it at his peril. Happiest release of all, without the slightest feeling of guilt we may use prepositions to end sentences with! God bless you, Dr. Bergen Evans!

* * *

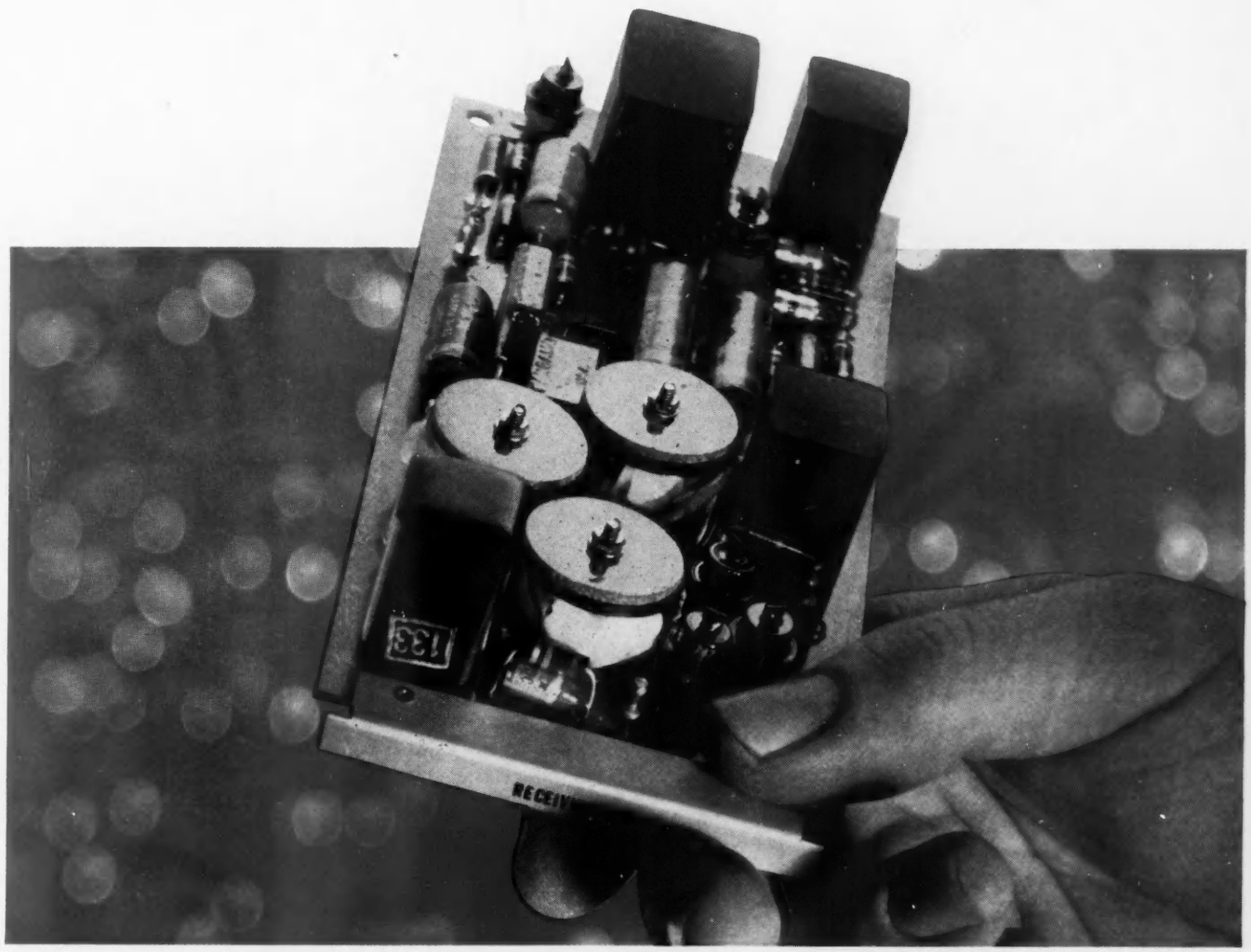
Hear Ye, Hear Ye!

OUR APPEAL to engineers, to devise something to stimulate the vocal performance of convention speakers, has been challenged. An A.T.&T. Company engineer — who prefers anonymity — tells us that the gadgets we cried for have been avail-

"561" SUBSCRIBER CARRIER

Amazingly simple to install and operate

Both central office and subscriber terminals employ plug-in printed circuit boards for easy installation and routine inspection.
Careful circuit design results in long life and exceptional reliability.
Contact your Stromberg-Carlson representative.



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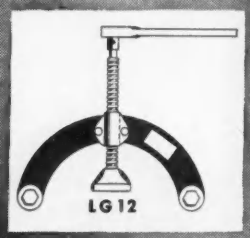
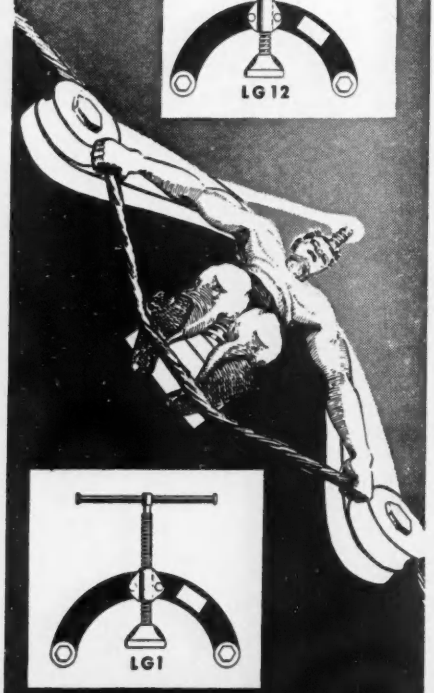
LITTLE Giant
SLACK PULLER

For pulling slack in a messenger you need a man with the strength of Hercules, the ruggedness of Atlas, the speed of Mercury . . . or a Little Giant Slack Puller.





If you need to pull slack in a messenger for any reason, either of the Little Giant Slack Pullers, the LG1 slip handle or the LG12 ratchet handle will do the job Quick, Easy and Safe.

WRITE OR PHONE

SERVING THE GROWING INDEPENDENT TELEPHONE INDUSTRY
CABLE SPINNING EQUIPMENT CO.
3100 TOPEKA AVE.
TOPEKA, KANSAS

able for years. He writes: "They consist of a pick-up microphone placed in the worst back row location, wired to the location of the public address microphone, then routed through an amplifier to a volume indicator. This will permit the speaker to 'see himself as others hear him'. The speaker's then action is a non-engineering matter."

So, it is up to us laymen to buy them, install them and see that they are used. We hope that our various convention committees will install these devices. They may need some auxiliary addition, perhaps some sort of relay-operated spur to jab the speaker if he ignores the message of the volume indicator.

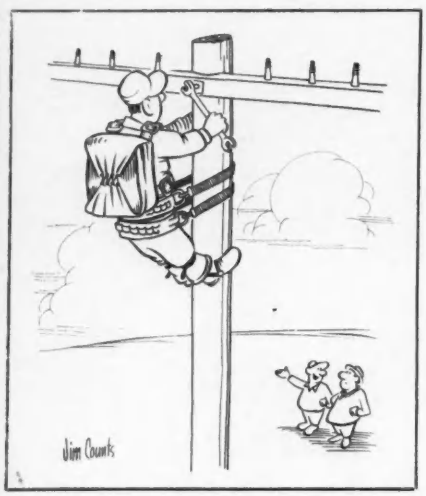
Inaudible speakers are not confined to telephone conventions, nor to this country. In London, the Society of Lecturers recently made a poll of clubs and study groups. They found that nearly half of the lectures they sponsored were not heard, because the lecturers did not talk loud enough.

* * *

Mechanized Mystery

A TOLL CHARGE item in our telephone bill reads: "Place/sta called 3241435 Toll charges .40". We understand the .40; but who, where and what is 3241435? To find out, we must call the telephone office and waste more than 40 cents worth of their time and ours, while the Decipherer of Cryptograms attempts to explain the mystic code to us.

Oh, yes, we are familiar with the arguments for mechanized billing — but what about our customers? Can we mechanize them? Or are we merely "automating" ourselves further away from any semblance of friendly human relations with them?



"Charlie *really* believes in safety first!"

* * *

Women n' All That

GEORGE BERNARD Shaw and others have pointed out that men, despite the contrary conceits of some of them, are the destined prey of women. We cannot evade them. Telephony offers a striking example. The first telephone managers were men, complete with beards, whiskers and moustaches. They hired boys for operators. Ours was a thoroughly masculine industry.

Then on September 1, 1878 someone slipped. The first woman telephone operator, Emma M. Nutt, was hired by the Telephone Despatch Company in Boston. Eleven years later, telephone women had become so numerous and menacing that undertaker Almon B. Strowger cleared a space on his embalming table and devised an automatic switching system. He did so for the express purpose of eliminating women from the telephone business. Technically and commercially, his system was a success. Objectively it was a failure, for more and more women poured in.

Since the end of World War II we have raised our dial mechanization from 59% to over 90%; yet in that period more than 50,000 women have been added to our payrolls. In late 1957, our 267,322 men in Class A companies formed a pitiful island in a sea of 414,266 women.

Planetary exploration may offer an escape; but there are traitors in our midst who would deny us that dim hope for the future. At the recent International Astronautics Association Congress in London, Dr. T. C. Helvey, an American biophysicist, said that — ". . . the best crew for the first attempt to land on the moon . . . would be two men and one woman . . ." Even with the protection of space suits, it is a horrible prospect.

Men, there is no way out. We live in a matriarchate and we may as well face our fate. Our only hope, a feeble one at best, is to try to get along with them. — *Leslie A. Gritten.*

"541" REPEATERS

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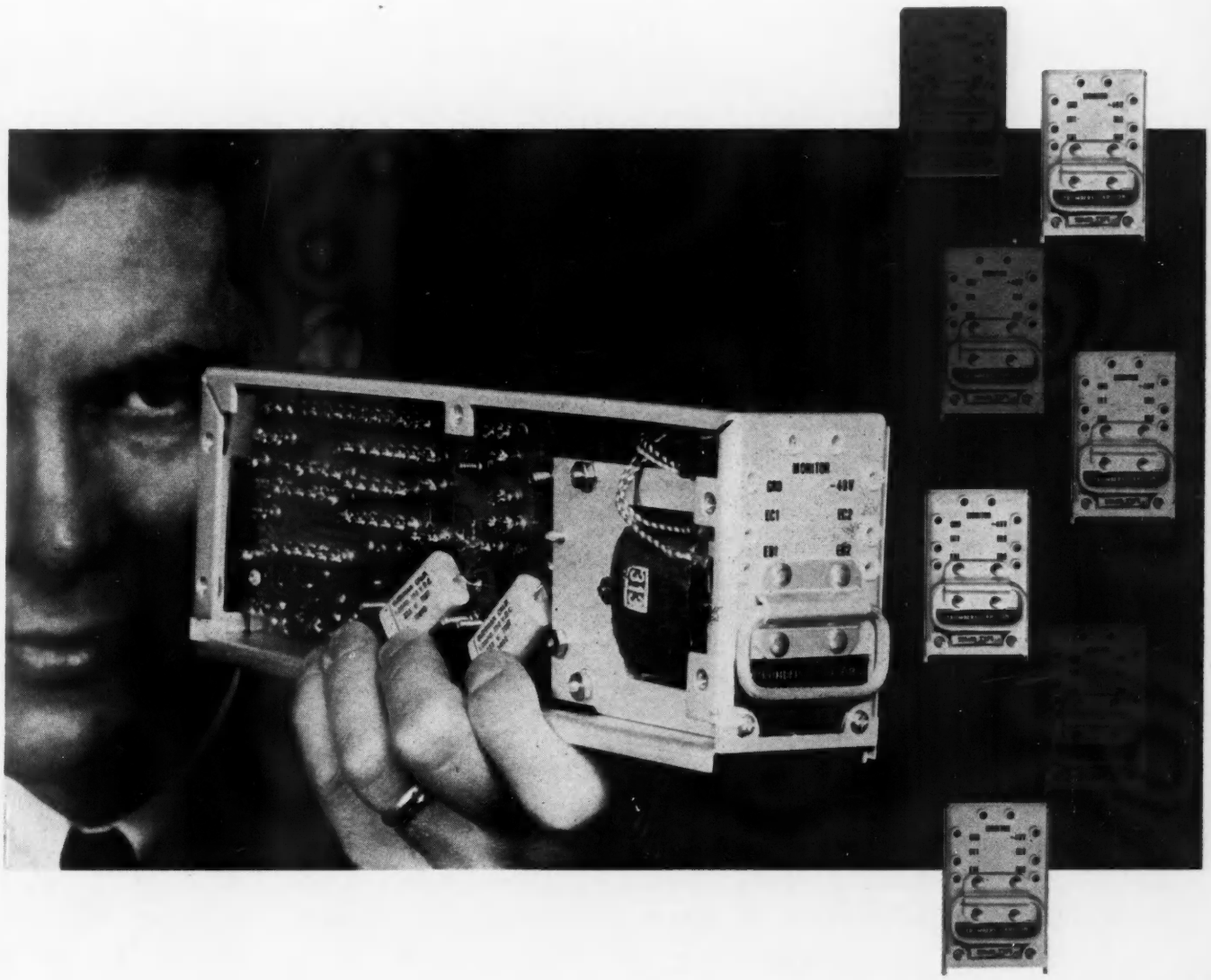
100% transistorized "541" Negative Impedance Voice Repeaters (series and shunt type) give you years of service without replacement; lowest power drain; reduced cable loading; greatest saving. Get details from your Stromberg-Carlson representative.



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no short straws!

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OPALON 1038 Underground burial cable, with excellent resistance to moisture and long service life.

OPALON 1101 Semi-rigid primary insulation for switchboard wire. High crush resistance, extrusion ease, for critical operation, excellent printability.

OPALON 1006 Primary Insulation for inside distribution cable, with good crush resistance, excellent flexibility.

Special Opalon compounds are available. Monsanto has also developed a complete line of polyethylene compounds for wire and cable insulation.

"551" REPEATERS

Hybrid type

These repeaters for toll and inter-office trunks provide substantial gain beyond the capabilities of other repeaters. Initial cost is low; maintenance is centralized; flexibility is outstanding. Contact your Stromberg-Carlson representative.

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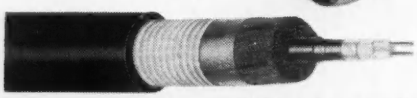
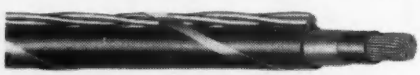
SPECIAL PURPOSE CABLES



Video pair composite

Submarine cable



Pre-lashed cable

Coaxial composite

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Superior's communication and control specialists teamed with modern manufacturing facilities produce cables to match your most exacting requirements.

You state the need, SUPERIOR will help you develop the specifications, then originate the design and construct the cable to meet it!

When you have any cable problems, tell it to your communication and control specialists . . . SUPERIOR!

SUPERIOR CABLE

SUPERIOR CABLE CORPORATION, Hickory, North Carolina

4235

AIRTRONICS revolutionary switch-gain amplifier REALLY WORKS...

...TO BUILD *increased sales*
revenue
customer satisfaction

Photo above shows how AIRTRONICS Switch-gain Amplifier fits directly into a Speakerphone control unit. (Fits all Speakerphone models). Your cost under $60. f.o.b., Ft. Lauderdale. Quantity prices on request.

AIRTRONICS

Switch-gain Amplifier, Model #2013

- is completely self-contained
- fits directly into standard Speakerphone control unit
- has only 8 connections
- can be installed in minutes
- has been thoroughly field-tested
- assures almost unlimited life
- requires virtually no maintenance

Advantages like these, exclusive with AIRTRONICS Switch-gain Amplifier, make for happy subscribers . . . keep sales and revenue climbing for you.

For complete information on the remarkable new AIRTRONICS Switch-gain Amplifier, write today for Bulletin #AI 1.040.

Add AIRTRONICS new transistorized Switch-gain Amplifier to your Speakerphone installations, then look for dramatic gains in sales, revenue, customer satisfaction.

Improved Speakerphone performance is the answer. And AIRTRONICS does it with a startling new advance in telephony that . . .

- Permits higher loudspeaker levels without feedback
- Eliminates need to adjust gain from call to call
- Functions effectively, particularly when acoustic conditions are poor and on PBX installations
- Makes each installation virtually independent of subscriber-loop characteristics

The Switch-gain Amplifier functions as a voice-sensitive switching pad or loss, which *automatically* lowers loudspeaker volume whenever the subscriber is speaking. Loss is switched electronically to the transmitter channel while the subscriber listens. A guard circuit keeps speaker-to-microphone acoustic feedback from causing improper switching when the speaker is operating. Net effect is reduction of acoustic coupling between loudspeaker and microphone to a degree where anyone, within 10 to 15 feet, can hear easily and distinctly without feedback or hollowness. The subscriber is not required to vary his gain control when shifting from a near to a more distant connection, or to toll.

another product first for

AIRTRONICS INTERNATIONAL CORPORATION

P.O. Box 8576, Fort Lauderdale, Florida (6900 West Road 84)

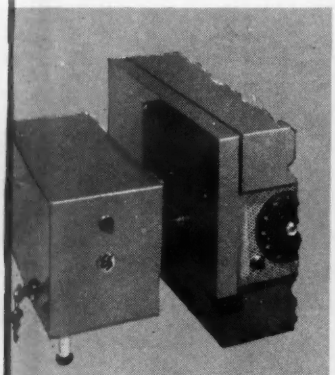
ELECTRONIC SECRETAR

MODEL
DCR-1

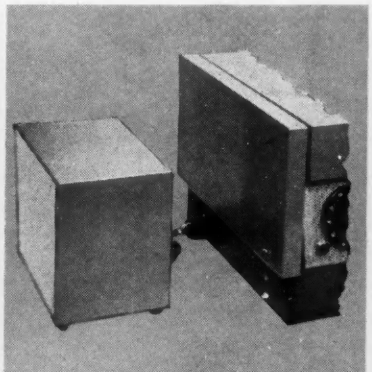
AR answering service

provides a complete phone answering service for your subscribers and brings you a steady flow of revenue!

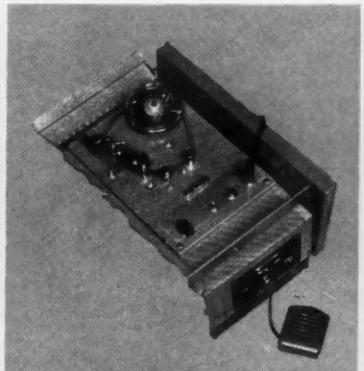
With the *Electronic Secretary* answering service, your subscriber no longer worries about missing important phone calls. It answers his phone courteously, dozens of times a day. It works around the clock, records name, number and message, or tells the caller to call another number—a complete secretarial service! A wonderful source of revenue for the telephone company! For complete information, call your distributor (listed below).



Remote Call-Back addition for Model DCR-1. Subscriber hears recorded messages by transmitting a tone signal over remote phone. The Electronic Secretary then switches to normal operation.



Voice Control Attachment for Model DCR-1. Permits caller to record message for extended period of time. Message is recorded as long as caller continues speaking. This attachment is ideal for receiving orders.



Tape Adapter modifies the DCR-1 so that user can record outgoing messages in his own voice. Includes microphone and endless tape cartridge (1½ to 3 minutes). Message can be changed as often as desired.

Model T-t Electronic Secretary. Answering unit only. User records outgoing message in his own voice. Endless tape cartridge (30 seconds to 2½ minutes). Message can be changed as often as desired.

ELECTRONIC SECRETARY INDUSTRIES, INC.

DISTRIBUTED BY: **AUTOMATIC ELECTRIC SALES CORPORATION**, NORTHLAKE, ILLINOIS

LEICH SALES CORPORATION, 427 WEST RANDOLPH STREET, CHICAGO 6

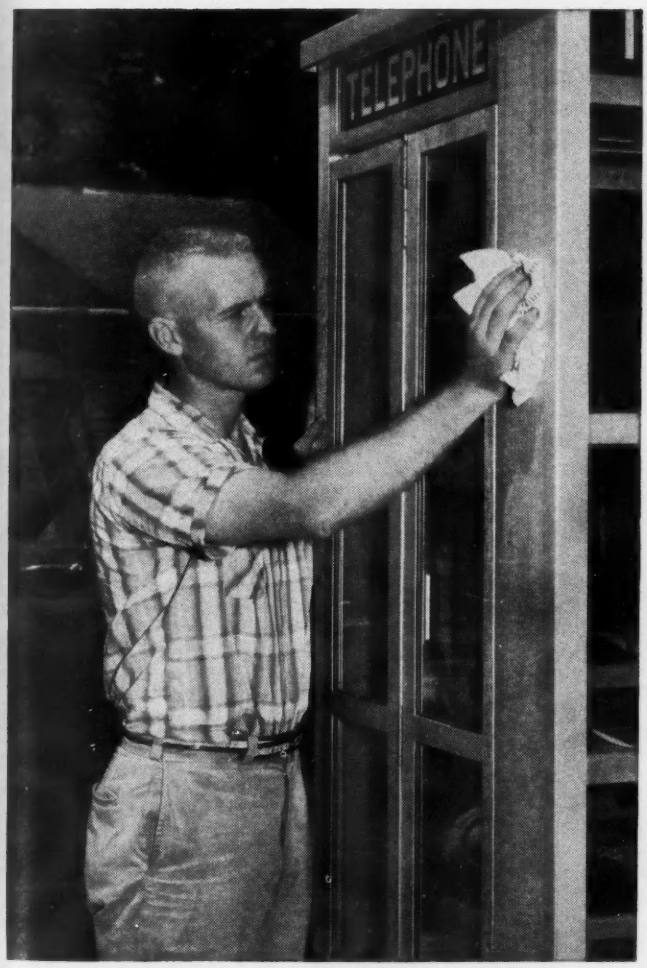
*ELECTRONIC SECRETARY is a registered trademark of Electronic Secretary Industries, Inc.

Added revenue from constant traffic at the roomy Alcoa booth in Oquawka, Illinois, pleases E. R. Watson, general commercial manager, Western Illinois Telephone Company.

"THIS ALCOA BOOTH PAID ITS WAY FROM THE START,"

reports E. R. Watson, Western Illinois Telephone Company

"Two years ago, we set up this Alcoa Aluminum outdoor booth in Oquawka, Illinois—a small fishing and resort town on the Mississippi—and it began paying for itself right from the day it was installed," declared E. R. Watson, general commercial manager for the Western Illinois Telephone Company.



"Maintenance is never a problem with Alcoa booths. A wipe with a damp cloth restores the aluminum to its original sheen, and the high-strength, solid Alcoa construction helps curb vandalism," says Mr. Watson.

"In peak vacation seasons, revenue from this one booth runs as high as $140 a month. People certainly seem to appreciate the convenience of outdoor booths and are attracted to the well-lighted and clean-looking Alcoa models. Like all 19 Alcoa booths on our system, installation was easy and maintenance is no problem. Routine sweeping and occasional washing are all that is ever necessary."

Telephone companies everywhere are discovering that Alcoa outdoor booths offer a sure way to gain additional revenue and customer goodwill. Their pleasing appearance, superior fluorescent lighting and larger interiors make them inviting to use. And the corrosion-resistant properties of high-strength, heat-treated aluminum give an unusually solid construction that assures profitable, long life investment.

FREE ALCOA GOODWILL KITS. Here's the big EXTRA that comes with every Alcoa booth. These free kits contain newspaper mats, publicity releases, envelope stuffers, radio and TV commercials—everything you need to tell your customers about the added convenience of booths of Alcoa® Aluminum.

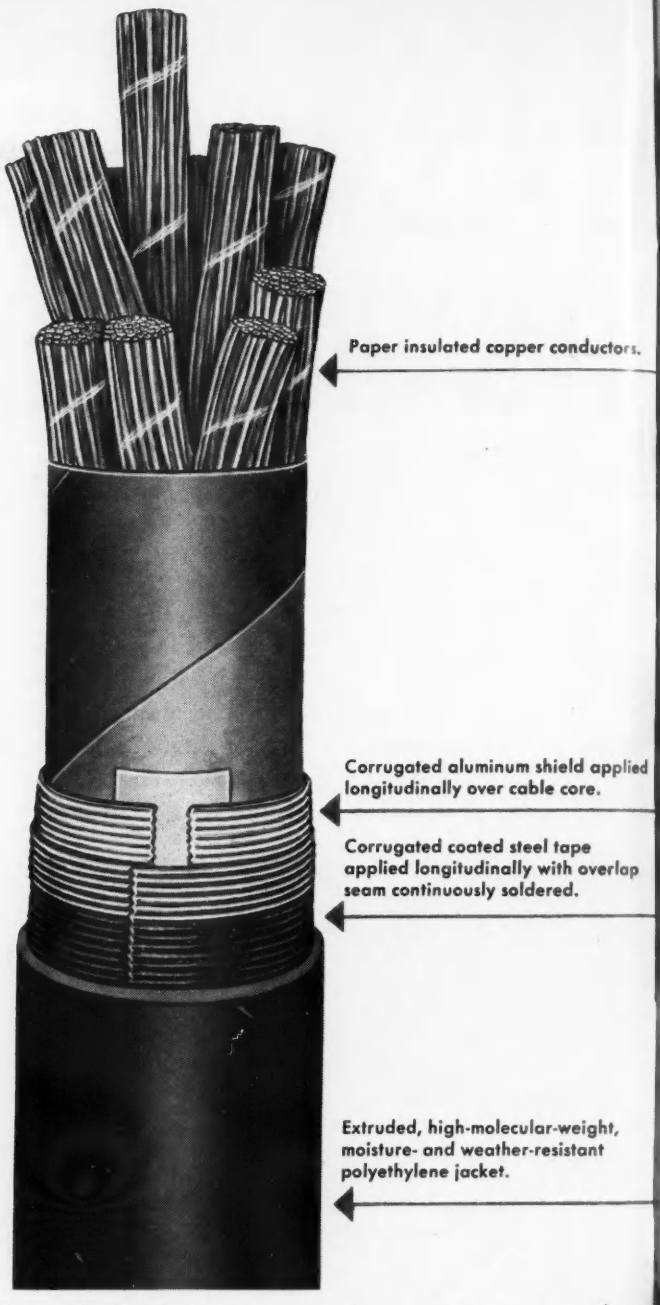
FOR MORE INFORMATION ON ALCOA BOOTHS, write for brochure. And ask your jobber how Alcoa booths can increase your revenue and build customer goodwill. Aluminum Company of America, 1721-L Alcoa Building, Pittsburgh 19, Pa.

For exciting drama watch "Alcoa Presents" every Tuesday, ABC-TV, and the Emmy Award winning "Alcoa Theatre" alternate Mondays, NBC-TV

ALCOA ALUMINUM
ALUMINUM COMPANY OF AMERICA

YOUR GUIDE TO THE BEST IN ALUMINUM VALUE

stalpeth the perfect exchange area cable for your plant


Paper insulated copper conductors.
Corrugated aluminum shield applied longitudinally over cable core.
Corrugated coated steel tape applied longitudinally with overlap seam continuously soldered.
Extruded, high-molecular-weight, moisture- and weather-resistant polyethylene jacket.

"The perfect cable," no finer is available to the independent telephone industry . . . because our research, engineering and manufacturing departments have made General Cable Stalpeth the finest. All raw materials used in Stalpeth must meet rigid requirements. At each stage of manufacture, Stalpeth is subjected to close inspection, and finally, the concentricity of the jacket is continuously controlled during extrusion by electronic instruments. Its excellent electrical characteristics, mechanical properties, light weight and ease of handling make Stalpeth the perfect cable...no finer is available.

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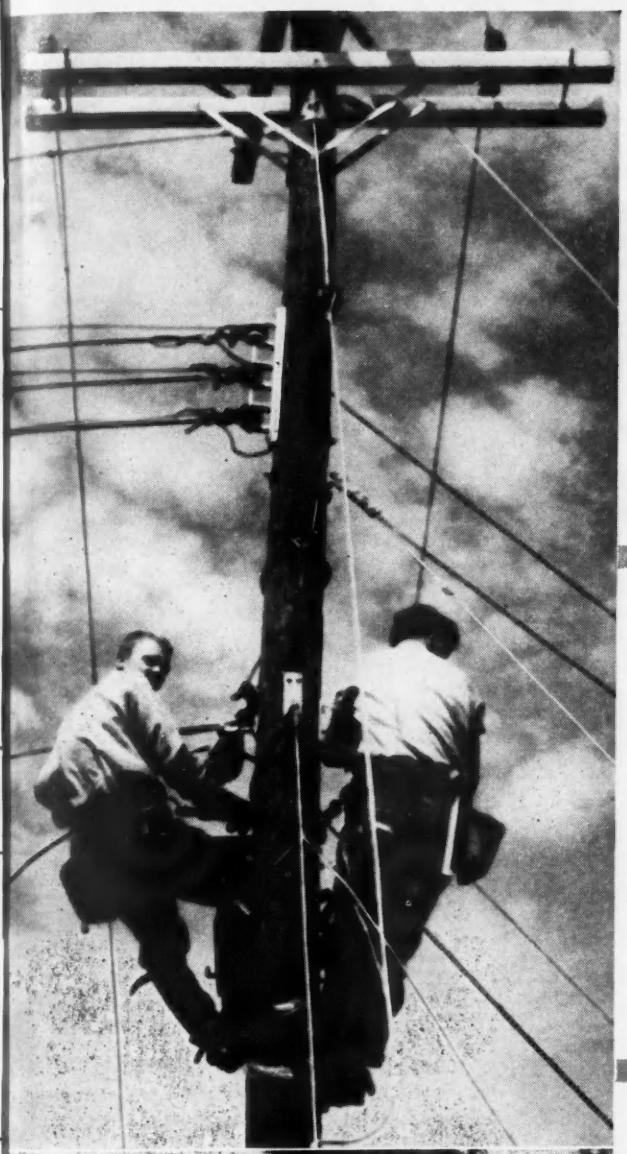


crews like it ...engineers like it

HIGHER INSULATION RESISTANCE

Each conductor in any length of cable, when measured against all other conductors and the grounded shield, shall have an insulation resistance of 1000 megohm-miles measured with a d-c potential of not less than 100 nor more than 550 volts applied for a period of one minute.

CAPACITANCE UNBALANCE VALUES

The capacitance unbalance, as measured at approximately 900 cycles shall not exceed the maximum requirements as noted in the following table:

ALL SIZES	LENGTH OF CABLE	PAIR TO PAIR MAX. CAPAC. UNBALANCE
19-22-24 & 26 GAUGE	Up to 1000 ft.	100
	1001 to 2000 ft.	150
	2001 to 3500 ft.	200
	3501 and up	300

MORE GUARANTEED PAIRS

SIZE, AWG	NO. OF PAIRS IN CABLE	MAXIMUM ALLOWABLE NO. OF DEFECTIVE PAIRS
19	All Pair Sizes	0
22	All Pair Sizes	0
24	Up to 303	1
	404, 606	2
	909 through 1818	3
26	Up to 202	1
	303	2
	404, 606	3
	909	4
	1212 through 2121	5

for quality and service... specify

GENERAL CABLE

GENERAL CABLE CORPORATION · 730 3rd Ave., New York 17, N. Y. • Sales Offices, Plants and Distributing Centers Coast-to-Coast

your BEST BUY...

USI Private Branch Dial Telephone Systems carry the unanimous "stamp of approval" brought about by widespread acceptance throughout the industry. USI Dial PBX's incorporate many "extras" as STANDARD FEATURES that will appeal to you and to your subscribers.

LOW INVESTMENT—Your initial cost is low . . . install a minimum number of stations and expand in economical steps as your needs increase.

QUICK, EASY INSTALLATION—Start your earnings at once with effortless installation by any qualified installer or maintenance man.

FULLY AUTOMATIC—Incoming calls are handled by secretary or receptionist with our compact desk-top set. Ringing, and completing internal or outgoing calls need no attendant day or night. Automatic call storage and transfer features.

TIME SAVING ATTENDANT'S SET—Stylish, compact desk set permits secretary to handle all incoming traffic with ease as well as her regular secretarial duties.

USI CORP.

• Call, write or wire us for a cost-free consultation and analysis of your communication needs.

• Order from stock for prompt shipment combining easy installation and maintenance. Order today! Profit tomorrow!

UNITED STATES INSTRUMENT CORP.

CHARLOTTESVILLE, VIRGINIA

New ORANGEBURG® CA* CONDUIT *with Flush Coupling Attached!*

With no separate couplings to handle or attach on the job, Orangeburg CA lays faster, costs less to install. Each long, light length has a *flush* coupling attached at one end and a standard 2° male taper at the other end, making installation a simple, one-step operation. And, since the coupling *is* attached, there are no coupling cartons to warehouse or carry to the job.

What's more, with the coupling *flush* to the conduit's outside wall, new CA is easy to stack, store and handle. The flush coupling also eliminates "staggered" joints in the trench. And that means real savings in cutting and tooling time.

Like the hundreds of millions of feet of Orangeburg fibre conduit in use since 1893, new CA has self-sealing joints and impermeable walls. Its smooth, 100% fibre raceway adds years to cable life.

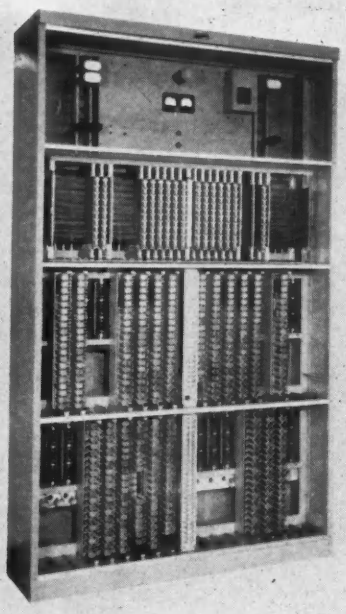
New Orangeburg CA is available in 2", 3", 4", 4½" and 5" sizes. Orangeburg Standard and Nocrete Conduit, with separate sleeve couplings, are available as always. Write Dept. TE-119 for Catalog 52.

ORANGEBURG MANUFACTURING CO.
Orangeburg, New York • Newark, California
A Division of The Flintkote Company, Manufacturers of America's Broadest Line of Building Products

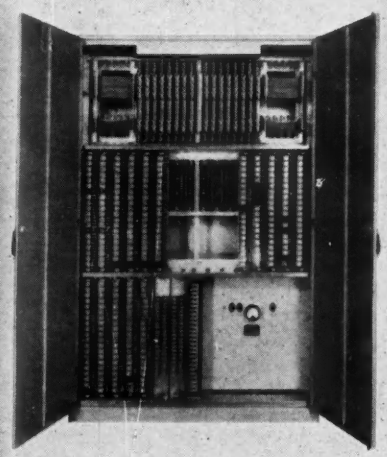
Orangeburg Fibre Conduit is distributed by Graybar Electric Co. and General Electric Supply Co. with branches and stocks in principal cities.

Show How Fast You Put

with LEICH PABX's from Stock



Leich's 88A PABX handles 88 lines, 9 links, and 10 trunks. Local links are not tied up on city trunk calls.



Leich's 40A serves businesses with up to 40 lines, 6 links, and 10 city trunks.

Leich's stock PABX's, the 40A a 88A, are equipped with modern key turrets and all-relay Leich dial swit ing equipment.

Once a subscriber decides on a PABX, he wants it installed as soon as possible. "How soon can I have it?" is often his main concern. That's why both Leich's 40A and 88A PABX systems are available from stock. They can be delivered to you within 30 days after receiving your order.

Many telephone companies have found Leich's stock PABX's so popular that they've sent us a standing order for several a month. We'd be happy to include your company in our stock PABX schedule, too. Write today for complete information.

LEICH

Subsidiary of GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

ut In Service

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Your LEICH
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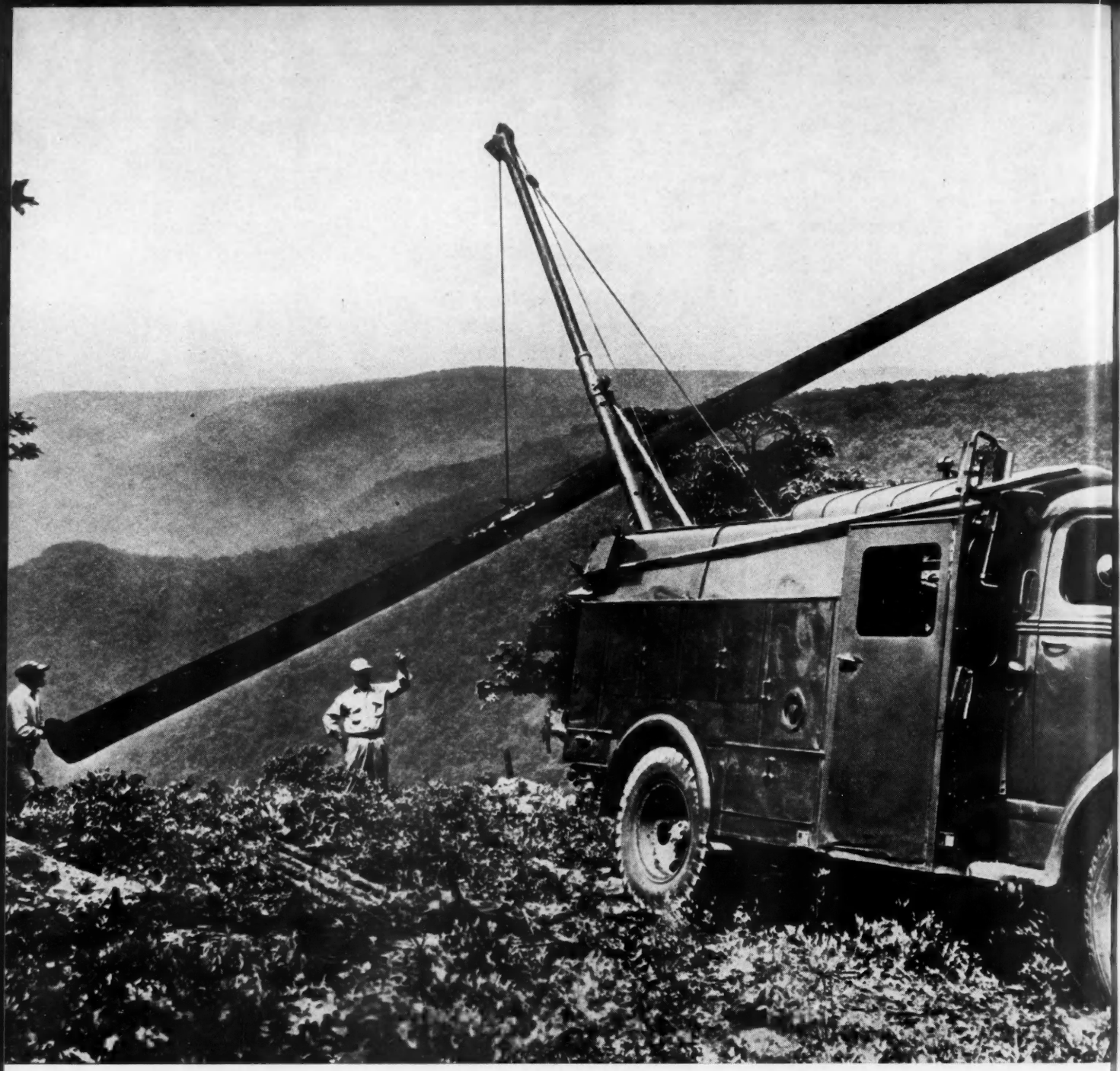
EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

manufacturers of telephones, switchboards and related apparatus since 1907



FOR EVERYTHING YOU NEE E

Kellogg is close by with fast, dependable co

Nuts, bolts, cable, terminals, batteries... you'll find everything it takes to run a telephone company under one roof at Kellogg. Eight completely stocked, conveniently located ware houses are only a phone call away. And when you call Kellogg you're talking with trained experienced telephone men who understand your needs, know exactly what you require. For telephony's most complete source of dependable equipment, such as shown on these pages, and fast, efficient service... call your Kellogg representative.

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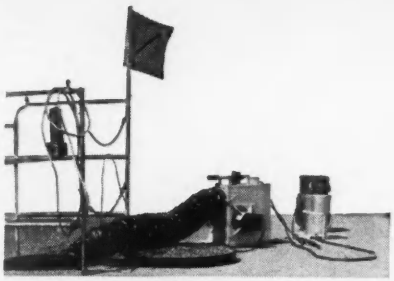
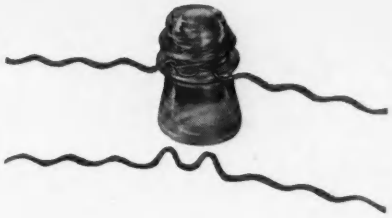
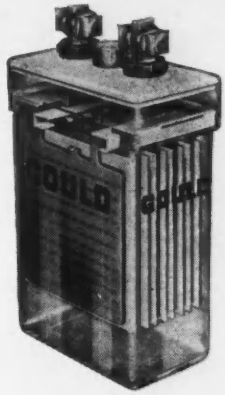


MoPeCo Model PE-G Ventilating Heater and Attached Generator—An aid to safe utility, construction and maintenance. Clears manholes of explosive gases, as well as furnishing an ample supply of fresh, heated air for all underground work. Portable, weighs only 78 pounds, with attached 300 watt DC generator providing current for a drop cord and electric light.
MORRISON-PELSUE COMPANY



Crapo Pretied Splints can be attached to insulator on the ground. Easy to install. Save time and labor. Permit resagging line wire without removing tie wire. Produced for galvanized steel and copper/steel telephone line wire. INDIANA STEEL & WIRE COMPANY, INC.



Outstanding Battery Performance is yours when you choose Gould Plante Batteries. Thick, grooved, pure lead positive plates give many years of trouble-free service! Made by GOULD-NATIONAL BATTERIES, INC., the finest money can buy.

Model B Howler—For eliminating service calls due to misplaced receiver. Produces distinctive signal tone, demanding attention; loud, yet safe. Equipped with subscriber controlled relay for fully automatic operation. LORAIN PRODUCTS CORPORATION.

Little Giant Slack Puller is a rugged tool. Made of heavy steel and bronze. All steel parts are painted or cadmium-plated. Comes in two styles, slip handle and ratchet handle (shown). Safe, easy to use! Made by CABLE SPINNING EQUIPMENT COMPANY.

World Standard for Quality since 1870, Hemingray Insulators—a product of OWENS-ILLINOIS. Available in a variety of styles and sizes for immediate delivery. No. 45—shown—employed for all toll and trunk circuits exceeding ten miles in length.

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Cook Cable Coat eliminates need for taped splices or potting, and can be provided with selective pair protection. Terminal blocks for making cable conductor taps are filled with plastic resin. Cutting and splicing are eliminated, and connections are made by tapping onto specified conductors. COOK ELECTRIC COMPANY.

Insulated *SQUEEZ* Sleeves—Reliable Type "N" Insulated *SQUEEZ* Sleeves simplify the splicing of multi-pair distribution wire. Inner and outer copper sleeves, separated by a color coded plastic insulating sleeve, insure an effective electrical connection and a moisture-proof seal without taping. Three sizes for multi-pair distribution wire, 19, 22 and 24 AWG, are clearly marked with Cat. No., die groove and wire size. Any standard N groove compression tool will fit all three sizes. RELIABLE ELECTRIC COMPANY.

POWERS American

PRESENTS THE SERIES PM-30 "Pole-Master®"

OSCILLATING HYDRAULIC DERRICK

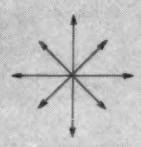
Think of the time that can be saved with this all-new "Pole-Master." Its scope of operation—*to each side as well as to the rear*—completely eliminates the necessity of positioning the truck precisely for each job. In alleys and narrow streets, the PM-30 handles work in cramped space which would present a job-delaying problem to crews using a conventional single-arc derrick.

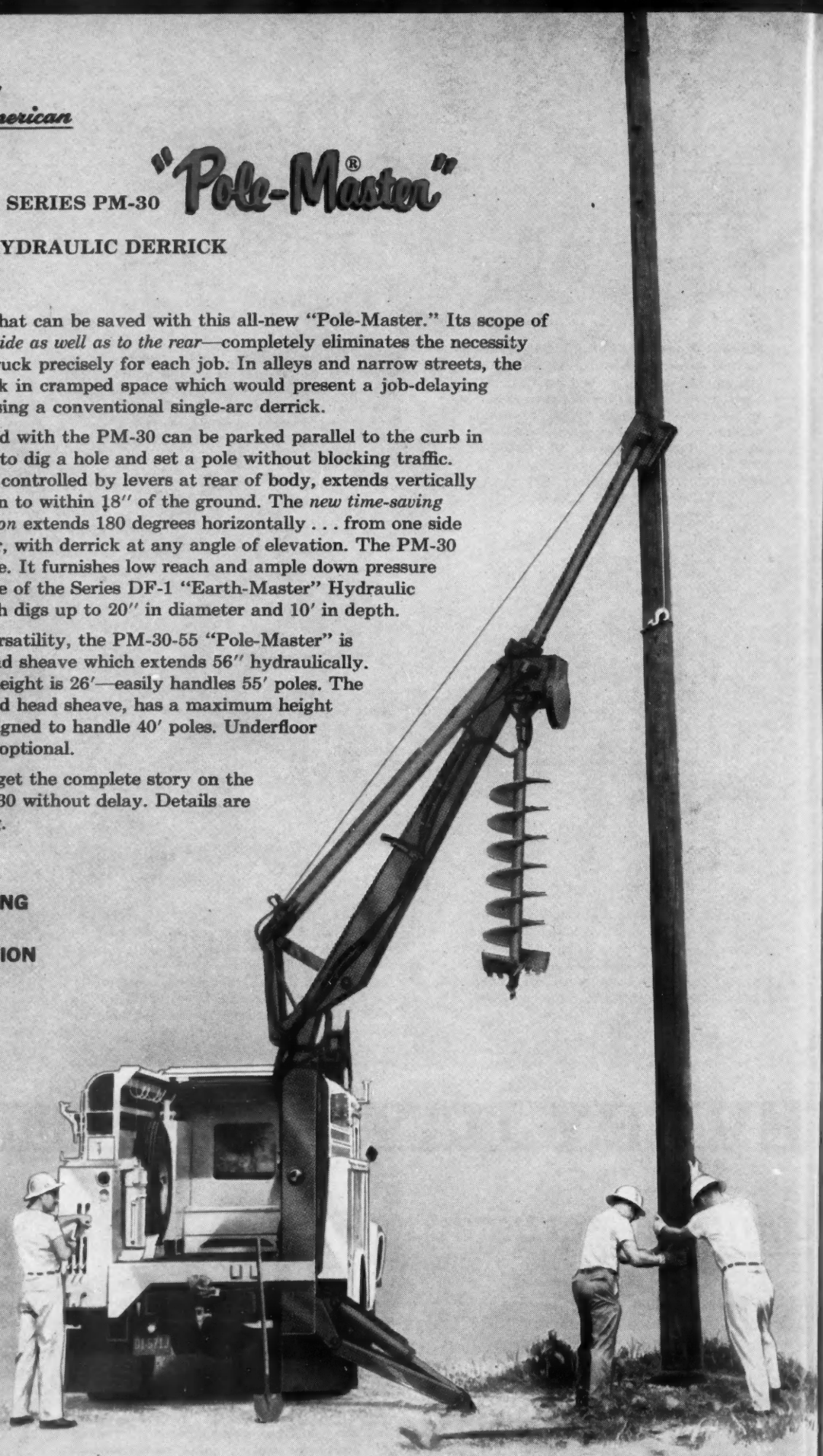
Line trucks equipped with the PM-30 can be parked parallel to the curb in congested areas . . . to dig a hole and set a pole without blocking traffic. Derrick movement, controlled by levers at rear of body, extends vertically from stowed position to within 18″ of the ground. The *new time-saving dimension of operation* extends 180 degrees horizontally . . . from one side of body to the other, with derrick at any angle of elevation. The PM-30 body-loads with ease. It furnishes low reach and ample down pressure for most efficient use of the Series DF-1 "Earth-Master" Hydraulic Digger shown, which digs up to 20″ in diameter and 10′ in depth.

For even greater versatility, the PM-30-55 "Pole-Master" is equipped with a head sheave which extends 56″ hydraulically. Maximum derrick height is 26′—easily handles 55′ poles. The PM-30-40, with fixed head sheave, has a maximum height of 21′ 6″ and is designed to handle 40′ poles. Underfloor winch line travel is optional.

Make it a point to get the complete story on the work-speeding PM-30 without delay. Details are yours for the asking.

A NEW TIME-SAVING DIMENSION IN DERRICK OPERATION





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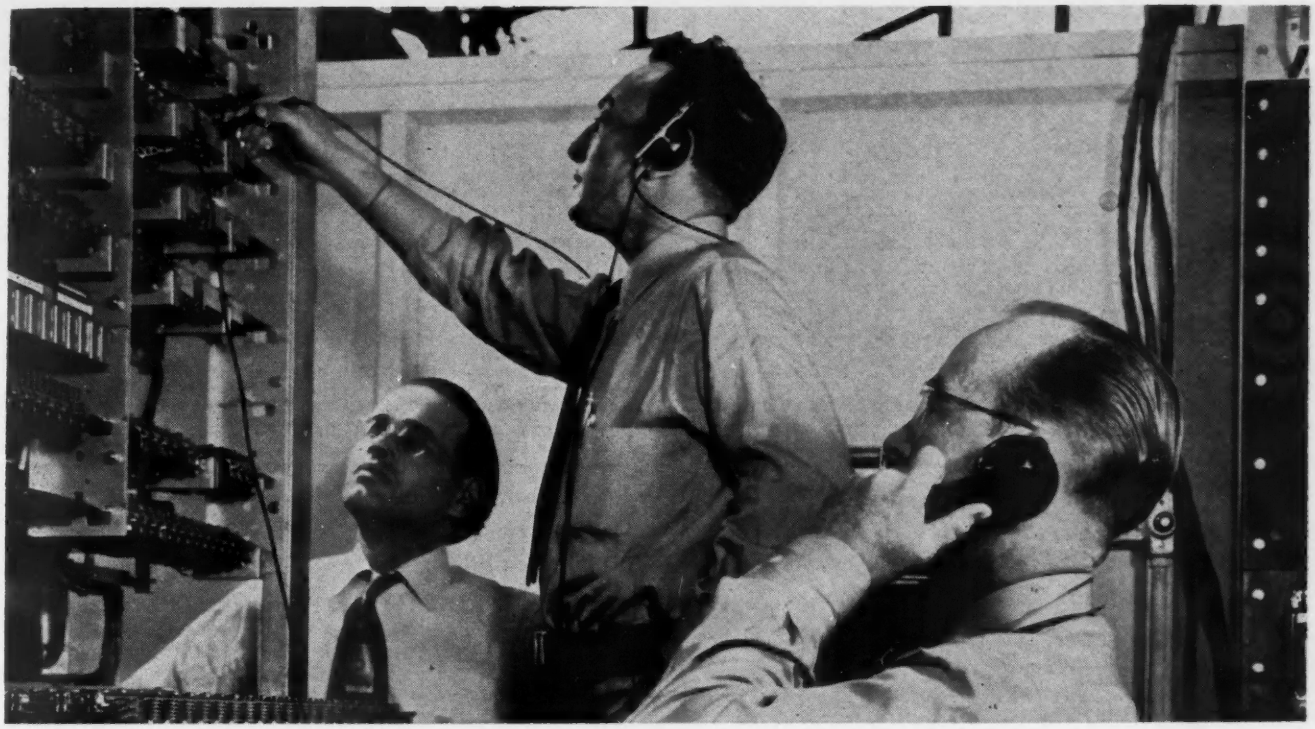

"Traffic Economics"

By L. G. BECK*

**Vice President and General Manager,
West Coast Telephone Co.,
Everett, Wash.**

√ If careful attention is given to the cardinal points of service objectives, force adjustment, training, force losses or turnover, absence control, customer instruction, dial office management, and the use of statistics, better results will be yours.

AS A STARTING point for this discussion of Traffic Economics, a definition of the responsibility of the Traffic Department should be considered. This responsibility can be simply stated as the acceptance of every offered call with the intention of completing it as quickly as can be done economically — regardless of the destination of the call, that is, whether it goes across the street or to the other side of the world — and also, regardless of whether it is handled manually by an operator, or whether it is directly dialed by the customer.

*Mr. Beck presented this paper at the 1959 *USITA Traffic Conference.*

This appears logical from the standpoint of comparison with other industries inasmuch as their traffic departments are associated with the movement of their products, and certainly in the telephone business telephone calls are our products.

In this analysis of Traffic Economics I will be guided by those things which we consider important in the operation of our West Coast Telephone Co. Some of the items may apply to your company and some may not.

So that you may be able to make comparisons of your own, you should know something about our operations. We operate 167,000 stations in the States of Washington, Oregon and California. Our traffic expenses will be about $2,300,000 this year. Our total telephone operating expenses, that is exclusive of depreciation and taxes, will be about 8½ million dollars, which means that 27¢ of our expense dollar, exclusive of depreciation and taxes, is spent by our Traffic Department.

About 90% of our stations are on a local basis and about 40% have access to nationwide customer toll dialing. We expect to be 100% local dial operation in the near future — close enough now that we can see it

with the lower part of our bifocals. We expect further conversions to DDD as the feasibility warrants. In spite of this mechanization we are still talking about a Traffic Department expense of over two million dollars and we think that amount of money requires some controls.

With only 10% of our stations on a local manual basis, it is apparent that most of our traffic expenses are associated with the handling of toll traffic. Under these circumstances the first point of reference in our monthly reviews of revenues and expenses is the relationship of the traffic expenses to the toll revenues. In other words, if our toll revenues go down we expect the traffic expenses to also be lower and, of course, when the toll revenues go up we expect some increase in traffic expenses.

Since 92¢ out of every traffic expense dollar is paid out for operator wages and training expense there can be little doubt as to where the greatest amount can be accomplished through the use of controls or better methods. Directly associated with this, of course, is the load or traffic efficiency.

Examination of our traffic expense and the system load carried shows that each point on the load represents approximately $12,500 of annual traffic expense. Thus when the load goes up one point we save $12,500; when it goes down a point our expenses go up by $12,500 on an annual rate. This load includes all operator functions 24 hours a day and includes Saturdays, Sundays and holidays as well as normal weekdays. We, therefore, consider this expression of load as a very significant measuring stick.

Now, to the specifics of Traffic Economics as we see them — they are: service objectives, force adjustment, training, force losses or turnover, absence control, customer instruction, dial office management, and the use of statistics.

Service Objectives

WE BELIEVE in establishing service objectives. Generally these objectives must be established by each company and related to the telephone needs of the community. We believe, however, that our customers expect us to be practical and being practical means operating a business on a sound economical basis.

In measuring the speed of an operator's answer the usual method is to use "% answers over 10 seconds." It is my understanding there are a lot of companies whose objective recording answer or CLR operator's answer is approximately 7% over 10 seconds. If this were stated in an average answer it would be something a little bit less than four seconds.

We measure our speed of answer in average seconds. We have established an objective of six seconds. In comparing this with the "% over 10 seconds" it means 15% over 10 seconds. Since a figure such as this would lose 10 points on the observation index as used by some companies this may be looked upon as a horrible grade of service.

Now, we recognize that this objective of ours which is two seconds slower ties up, in a dial office, a line-finder, a first selector and the trunk equipment two seconds longer than the faster objectives and, therefore, demands more equipment. On the other hand, it is equally apparent that if faster answers are given it takes more people and, therefore, more positions.

In our case these items are all fractional and have therefore been discounted. We arrived at our average answer objective of six seconds because the normal ringing interval on our ringing machines is six seconds. The average subscriber does not expect anything to happen until he has heard at least one ring back.

We, therefore, thought that our subscribers would be satisfied with the service where, on the average, the operator answered after one ring back. We have asked a lot of our subscribers and, in some cases, subscribers of other companies this question — "Would you be satisfied with the speed of an operator's answer if nine out of 10 times you were answered before the second ring back?" There has never been anything but an affirmative answer to this question.

As further proof of the reasonableness of this objective we have had no comments of slow service when we have provided an average answer of six seconds. It may be of further interest to tell you that we operate in some areas which are immediately adjacent to offices where the four second answer is the objective without complaint of slow answers from our subscribers.

In addition, early this year we transferred about 14,000 stations from one of these adjacent toll centers to a toll center of our own without the subscribers, in general, being aware of the change. Since that time we have had no complaints of slow answers. As a matter of fact we doubt if very many of our subscribers, or yours, can tell the difference between a four second and a six second answer.

Your logical question can be, "Is there a dollar value that you can place on this difference in objective?" We think we can; however it must be estimated for the very simple reason that it is impossible to handle the same traffic under two different conditions at the same time. Careful analysis, however, of our loads and our speed of answer indicates that, on a system basis, the two second difference in average speed of answer represents a seven point difference in the load and at $12,500 a point this equals $87,500 a year.

Force Adjustment

THE SECOND item we mentioned in connection with Traffic Economics was the matter of force adjustment — and there have been countless speeches and papers on this subject and I might add that most such papers and speeches have complicated rather than simplified the subject of force adjustment.

We believe that force adjustment can be stated very simply as being the provision of the right number of right people on duty at the right time. Over the years we have heard many discussions about the use of ex-

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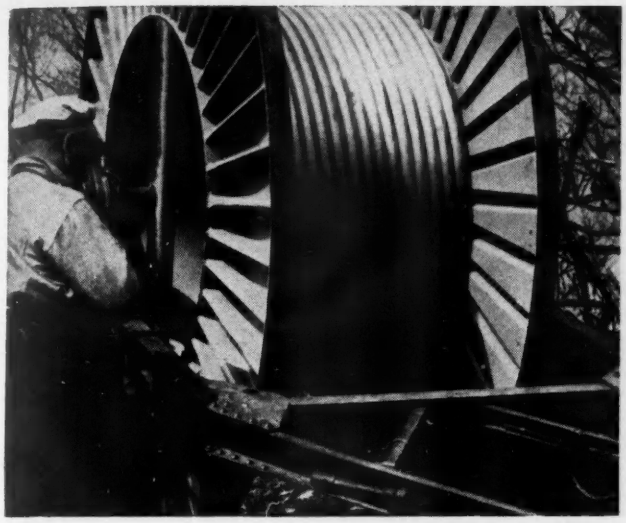
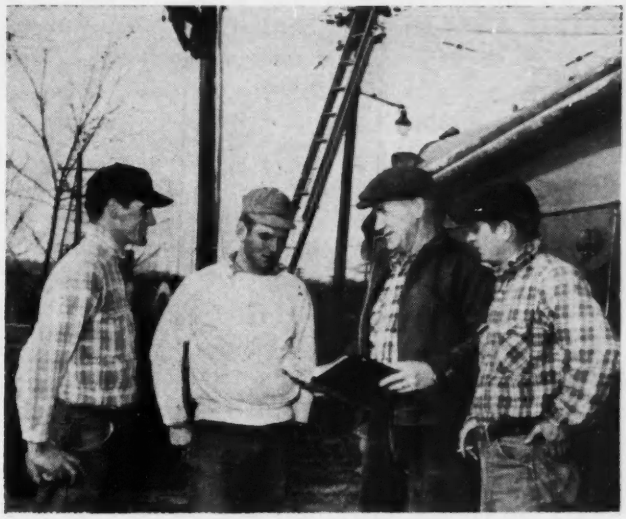




Management's Responsibility For Safety

By RALPH J. CROSBY*

Assistant Vice President,
Marsh & McLennan, New York City

√ ***The successful accident prevention program is backed by a management that recognizes its responsibility for — (1) planning the program, (2) establishing the objectives and (3) organizing procedures that will achieve the desired results.***

MANAGEMENT'S responsibility for the prevention of accidents is the same as its responsibility for the administration of any activity that effects the efficient operation of its business.

Accident prevention is a function of management, since only management has the authority to correct the practices of employes and the resources to change conditions which can cause operation upsets.

Certain misconceptions in the past, many of which still influence the action of present day managements, have seriously handicapped the progress that could be made in reducing personal injury and the material losses resulting from accidents.

Prior to the inception of compensation laws, industry did very little organized accident prevention work beyond the inspection of physical conditions, especially those that presented the possibility of a catastrophe. The idea of making accident prevention a part of the daily routine or an inherent part of the production schedule of a plant was in the minds of a very small group.

Beginning in 1911, the passage of compensation laws by several states forced management's attention to the cost of accidents to workers. The law required the employers to remunerate injured employes whether or not negligence could be proved.

Although this change did direct attention more to finding the cause of accidents rather than the degree of fault on the part of a worker, which had been the case, there were other factors that influenced the activity of management in the field of accident prevention: Compensation insurance was made available and relieved management of the financial liability; the practical application of the basic philosophy of accident prevention was not understood; attention was focused on injury prevention rather than accident prevention; the causes of accidents and the reasons for the causes were not recognized as being the same as the causes of production interference; and the control of employe performance where safety was involved was not considered a part of the supervisor's responsibility.

But, today things are different. We know: (1) an accident is a symptom of something wrong either in our method of operation or the attitude of our people; (2) an accident is any unwanted or unplanned occurrence and not limited to personal injury; (3) the cost of accidents involves more than the compensation and medical payments; (4) the down time, waste, interference, delay and damage to equipment far exceed the cost of injuries; (5) accidents don't just happen and in the great majority of cases do not occur from unfore-

Mr. Crosby presented this paper at USITA's 1959 Plant Conference.

seen or unexpected circumstances; and (6) we also know it is reasonable and practical to say supervisors have the opportunity and should possess the qualifications necessary to control the performance of employes under their direction.

Successful accident prevention requires the intelligent application of these proven principles. It is management's responsibility to do the planning, to establish the objectives and organize the procedures that will be the framework for achieving the best results.

Also, it is management's responsibility to maintain an active interest in the functioning of the procedures and to do sufficient checking to identify any weaknesses. A lack of top management's continued support is most frequently the chief cause of an ineffectual program. Management must not only furnish the initial impetus but also maintain its momentum.

In establishing a program, management should adopt the same approach it does on other problems. It is not to be expected that all details of a program can be achieved immediately. It takes time to change attitudes, to adequately indoctrinate people, and to study operations. Some long range planning is necessary but the ultimate objective should be recognized in the established procedures.

Management's responsibility in safety is divided into four parts: (1) a clear statement of company policy; (2) an outline of the duties and responsibilities of persons in the line organization covering their participation in the program; (3) establishing procedures that will be adopted to achieve objectives outlined in the policy statement; and (4) designating a representative of management who will administrate the program.

Let us consider these four items in a little more detail.

Statement Of Policy

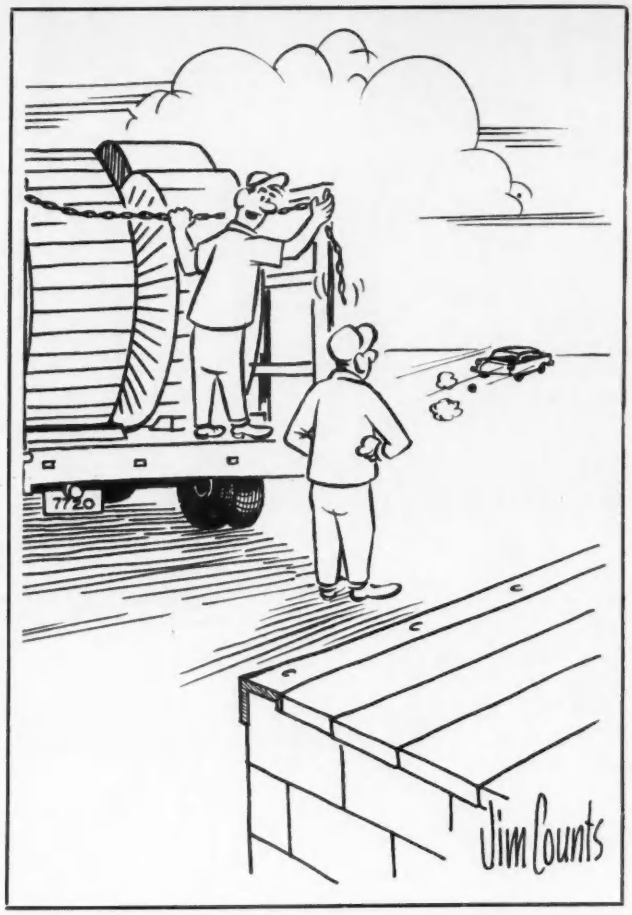
THE TOP executive must set forth a clear statement of policy on the importance attached to the individual's participation in accident prevention activities. He must express the benefits that will result from both a humanitarian aspect and economic point of view. He must explain the value an accident-free operation represents to the individual, to supervision and to the organization.

There should be a clear indication in the statement that management is convinced the value of an accident prevention program is measured not by the savings in direct cost but rather by the elimination and control of the causes of potential losses.

It is important that this policy be understood all the way down the line because what management thinks is bound to influence the attitude of everyone in the organization.

Responsibilities

THE ADMINISTRATION of the details of the accident prevention program may be delegated to a department or individual but the responsibility of preventing accidents rests with all supervisory personnel. Each



"What did he mean . . . 'Get the lead out' . . . this is all *plastic* cable!"

supervisor must accept the responsibility of controlling the performance of the people under his or her direction. Since the causes of accidents are the same as the causes of performance failures we are not adding additional duties.

Each department head must accept the responsibility of carrying out the intent of each procedure in the manner outlined by the individual delegated by management to adminster the program. There are nine areas of activity that warrant special consideration: —

(1) *The Indoctrination of Employes*

Employes should be indoctrinated on all phases of their participation in the program. They should understand the interest management has in their safety. They should be told what management has done to make their job and working environment safe. They should be shown that accidents do not occur from unexpected or unforeseen circumstances, but are the result of employes deviating from standard "right ways" of doing a job. They should be told no job anticipates that a person will have an accident or be injured. Each job has been thought out so there are no unusual physical demands on an individual.

It is anticipated, however, that employes will follow instructions and if they are confronted with some circumstance that seems to be awkward or, in their judg-

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How Large Companies Can Finance Rural Development Through REA

By ELNATHAN GATES*

President,
Minnesota Telephone Co.,
Minneapolis, Minn.

√ ***Here's how Minnesota Telephone Co., a Delaware corporation financed with private capital, proved it is economically feasible to establish a separate REA-financed company to handle the improvement and expansion of rural telephone service.***

BILL WINTERS, the hard working chairman of our R.E.A. Borrowers Committee, delegated me to address this meeting on the subject of his own choosing: "How Large Companies Can Finance Their Rural Development Through R.E.A."

This is further evidence that they think and talk big in Texas and there are no small companies in Texas. However, statistics prove that Texas has 60 R.E.A. borrowers with $36,818,000 advanced through July 31, 1959.

The subject of my remarks is based upon our experience and pertains to all companies, large or small, corporations, cooperatives, partnerships or individually operated companies that qualify under the telephone amendment to the R.E.A. Act.

It is our opinion that the vast majority of the Independent companies in the middle western and southern states of the United States do serve sufficient rural communities, including switching companies, to establish a separate R.E.A. loaning company that would prove economically feasible.

It is also our opinion that many of the rural communities served by the Independent companies, as well as the Bell Companies, are now operating in the red

Mr. Gates presented this paper at USITA's 1959 Conference of REA Borrowers.

on an individual exchange basis. The establishment of a separate associate company would eliminate this operating loss.

REA Loan Eligibility

ONE OF THE first qualifications for an R.E.A. telephone loan is that the funds must be expended for the improvement of telephone service and the expansion of service in the rural areas.

The term "rural area" shall be deemed to mean any area of the United States not included within the boundaries of any incorporated or unincorporated city, village or borough having a population in excess of 1500 inhabitants. However, the act further provides that: "*When it is determined by the Administrator to be necessary in order to furnish or improve telephone service in rural areas, such loans may be made for the improvement, expansion, construction, acquisition and operation of telephone lines, facilities or systems without regard to their geographical location.*"

This provision permits the administrator to make loans for telephone facilities that are located within cities, villages or boroughs of more than 1500 inhabitants, if such facilities are necessary to the provision of adequate telephone service outside the boundaries of such places.

The present administration will approve loans on the following basis: If the area coverage survey indicates there are more rural than urban subscribers or if the expansion, rehabilitation and construction costs are more for the rural subscribers than for the urban subscribers as established by the area coverage design.

Our R.E.A. loan companies, serving 80 exchanges in Minnesota, Iowa, Illinois and North Dakota, have, in the interest of improved communications service between urban and rural subscribers, adopted the R.E.A. policy pertaining to switcher lines: — "*The provision of economical and efficient telephone service indicates the desirability of having a single system serve both the urban and rural portions of a single community of interest to the maximum possible extent, thereby eliminating the need for switcher lines around the major towns and community centers.*

"*The acceptance of the privilege of serving the more profitable areas carries with it the responsibility for also serving the less profitable rural areas within the same community of interest. In those cases where existing companies now serve the surrounding rural areas, they should be willing to transfer the entire responsibility to an operator that is willing to carry out the over-all responsibility thereby eliminating the divided service responsibility.*"

We have found that most switcher line companies want to get out of the telephone business rather than improve their plants to meet the requirements of modern dial exchanges.

I will attempt to give you a proven example of how any company can obtain an R.E.A. loan to convert, expand and rehabilitate exchanges serving rural areas.

The Minnesota Telephone Company, a Delaware Corporation financed by private capital with 4½% bonds, was faced with a demand for dial service in two county seat communities, each with a population in excess of 1500, and two other small exchanges.

This company did not own or operate a single rural telephone beyond the city limits of the sample county seat exchanges. The rural areas of these communities was made up of a very large trade territory with large farms averaging one subscriber per mile.

The switcher companies, serving the rural areas, were not large enough to qualify for an R.E.A. loan and our privately financed company was not anxious to make the $500 per station investment to take over and construct a new modern rural system, using its source of private financing. Even though the private financing was available, we did not feel the project was economically feasible other than through an R.E.A. loan.

We have another company in Minnesota that has been financed by R.E.A. funds since 1950. The privately financed company sold these exchanges to the R.E.A. financed company at the net book value approved by the Minnesota Railroad & Warehouse Commission and the R.E.A.

In 1950, when the original loan of the Minnesota company was approved, the R.E.A. office in Washington insisted that the R.E.A. company have a management contract with the larger privately financed company at cost.

It would be my opinion that the Washington office of the R.E.A. would insist on a similar management contract between R.E.A. and privately financed companies, and between more than one R.E.A. company, regardless of the geographic location of exchanges.

The management contract covers management, engineering, accounting, commercial, traffic, purchasing, central billing, taxes, insurance, hospitalization, pensions and payroll services. Other than direct charges, costs of these services rendered to the associate company are allocated on a main station basis and are actually quite simply applied.

The latest U.S.I.T.A. statistical volume shows there are 3,867 Independent operating companies serving at least 50% of the geographical area of the United States. Of that number, 463 are commercial R.E.A. borrowers and 210 are cooperative borrowers.

By simple deduction, there are 3,194 Independent companies in the United States that do not have R.E.A. loans. Many of these companies do not operate in the sparsely settled areas of the United States. However, since the R.E.A. telephone loan agency was enacted into law on October 28, 1949, loans amounting to $585,212,415 have been approved.

This expenditure brought initial modern dial service to 542,028 subscribers and improved service to 688,314 subscribers, a total of 1,210,342 potential toll users that could bring toll revenue to every telephone company in the United States including A. T. & T. and associated companies.

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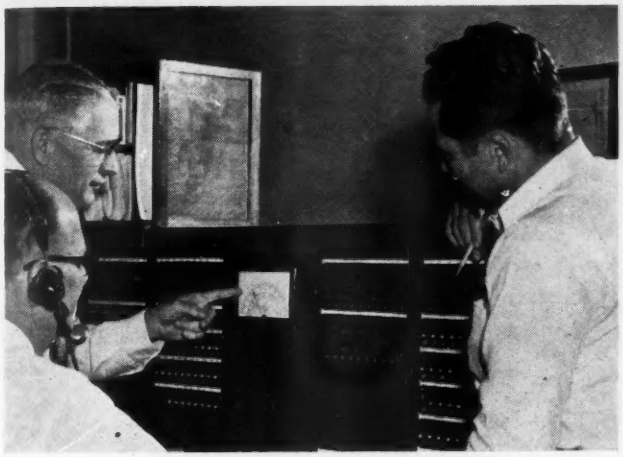

The What, Why and How of Traffic Engineering

By DON CHILDERS*

Connecting Company Agent,
United Telephone Co.,
Kansas City, Mo.

√ ***Traffic Engineering is not a new or novel function and it can be rated as one which has continuously grown in importance and for which the future looks bright and busy.***

"The time has come, the Walrus said,
To talk of many things;
Of shoes — and ships — and sealing wax —
Of cabbages and kings;
And why the sea is boiling hot,
And whether pigs have wings."
— Through the Looking Glass

LIKE THE WALRUS, your Traffic Committee thinks that the time has come to talk of a wider variety of things, and has decided to add to the talks of administrative functions, which have occupied the majority of the time in the past, a discussion of the function of Traffic Engineering.

Traffic Engineering can hardly be classed as a new or novel function in the Traffic Department, but it can certainly be rated as one which can continuously grow in importance, and for which the future looks bright indeed. With the rapid developments now taking shape in the various laboratories, especially in switching techniques, I do not hesitate to predict that we will find ourselves hard pressed to keep our traffic engineering practices up-to-date. I am sure I hardly need to predict further that we shall need to be prepared for this by recruiting and training personnel whose technical skills and managerial potential are of a high order.

Just what sort of technical skills are required of the Traffic Engineer? Are they the same as the electrical or mechanical engineer, or are they something special? Perhaps a good way to answer this question is to look briefly at the history of this job.

As soon as the early telephone exchange became something more than a "one man show," the job of completing connections was an obvious candidate for assignment to a specialized work force, and the Traffic Department came into being. It seems logical to assume that with the arrival of the first service complaint, thereafter the Traffic Department was handed responsibility for quality of service.

Quality of Service

IF WE look at the operating job more closely, however, it is obvious that the responsibility for service quality would have belonged there, with or without a complaint to start it off. It is one of the duties of any department to do its job with a minimum of expense, and this includes salary expense. But in Traffic, saving of salaries by cutting forces may easily result in poor service.

Thus, Traffic management is called on to answer the question: "What is the minimum number of operators

**Mr. Childers presented this paper at USITA's 1959 Traffic Conference.*

we can provide and still give our customers a satisfactory grade of service?" After determining what makes a satisfactory service, we then find ourselves investigating many by-paths. Some of these are matters of equipment design and its effect on the amount of work that an operator can perform in a given time; others are concerned with statistical measures, estimates, and distributions of traffic, both in time and in space.

The design questions are, to be sure, common enough engineering problems, and while their origins are properly in the Traffic Departments, their solutions are worked out, more often than not, in cooperation with the Engineering Departments and the laboratories of the manufacturers. The statistical problems, on the other hand, are unique to the Traffic Department. For practical reasons, our traffic data and estimates are nearly always expressed in averages, yet the traffic we deal with arises from a multiplicity of individual sources each acting more or less independent of the other.

Under these conditions, the precise methods of the accountant or the mechanical engineer will not work, and we must turn instead to the more abstract methods of the statistician and the mathematician. By these methods, we manage to infer — and with a high degree of accuracy, too — what are the optimum specific solutions to our problems, based on data expressed in averages. So far as I am aware, the nature of the problems, and the methods of solution, are not duplicated or approached in any other branch of the industry.

Thus the Traffic Departments find themselves with a definite engineering function to perform. To meet the equipment design requirements, the men doing the job should be familiar with manual skills and ingenious in providing equipment arrangements to permit such skills to be used to best advantages. To solve the problems of traffic capacities, they should have a strong mathematical bent and some familiarity with statistical processes. All of these are, of course, engineering skills.

You may have noticed that what I have said up to now has been based on manual operations, and you may have questioned whether it would be valid for machine switching operations. It most certainly is. Our primary interest is the adequacy of traffic facilities, and from a purely engineering standpoint, there is very little difference whether we express this in terms of the availability of operators, circuits, and positions, or in terms of the availability of switches and trunks.

Now that we have looked at the origins of Traffic Engineering, we feel that we can safely attempt a broad definition, and we therefore submit the following:

Traffic Engineering is responsible for recommending quantities and arrangements of central office and trunk equipment which are adequate to enable the customer to reach the called party easily, quickly and surely. This includes considerations of numbering plans, local and toll switching arrangements, the number of paths and switches and the balance of traffic in dial units, the adequacy of toll circuits and manual switchboard equipment, arrangements for intercepting and information, etc.

In order to point out that there is no conflict between the above responsibilities and those of the General Engineering Department, we should understand that the latter is chiefly responsible for what we might designate, for convenience,the technical aspects of the equipment layout. These would include items such as grade of transmission, economical floor layouts in equipment rooms, adequate power supplies, provisions for testing and maintenance, and the preparation of work orders and specifications for the suppliers.

Returning now to our definition of Traffic Engineering, let us see if we can break these basic responsibilities down into specific activities or subfunctions.

Planning

CERTAINLY NO activity is going to proceed in an orderly manner without some kind of forward *planning*, and in the telephone business, this is of utmost importance, since without planning there can be no responsible budgeting of capital expenditures, and without such budgeting it is most unlikely that there will be adequate financing to meet the demand for an expanding service.

Within the limits of our Traffic Engineering responsibilities, what sort of planning is required? First, there should be cooperation with the General Engineering people in preparing long term fundamental plans, including toll centering plans, intertoll dialing plans, numbering plans, local, interoffice and toll switching plans, etc. Second, Traffic Engineering should determine the dates when specific jobs are required for relief, etc., the amount and types of equipment needed, and should cooperate with General Engineering in setting up time schedules for the various activities to get the jobs completed.

It should be noted here that the basis of all planning for growth and development is a reliable estimate of future demand. This is usually provided by Commercial Engineering, and the cooperation of this group, not only at the start of planning but also throughout the procedure, is much to be desired.

Economic Selection

SOMEWHAT AKIN to planning is the activity we shall designate as *economic selection.*

As we all know, perhaps too well, there is often more than one way to do a job. The choice between alternatives is usually a plain matter of dollars and cents arrived at through comparative studies. In most organizations final authority for economic selection is given to the chief engineer. However, Traffic Engineering has the responsibility of assisting by providing estimates of equipment quantities required and of operating costs under the various plans.

Traffic Engineering will also be called upon to assist in evaluating anticipated service improvements, especially where the value of such improvements is intangible,

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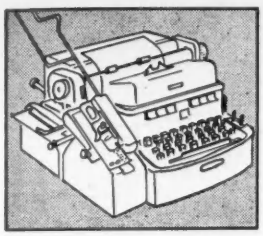
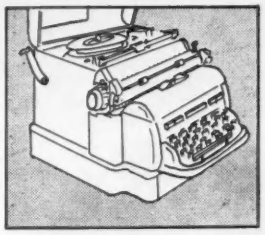
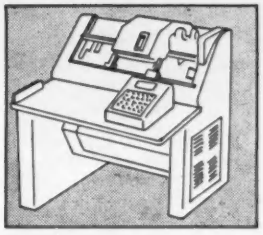
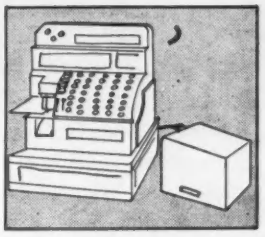
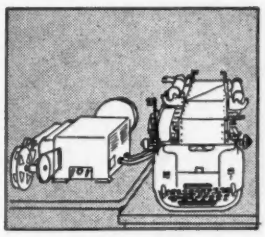
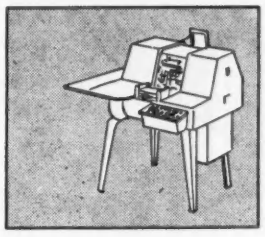

Accounting Report Reviews

FCC Rule-Making Proposals

Presented By W. H. TODD*
Chairman,
USITA Accounting Committee

√ ***1959 was a busy year for the USITA Accounting Committee. Activities involved close studies of rule-making proposals by the FCC and the Internal Revenue Service.***

IT IS A PLEASURE for your Accounting Committee to submit its report for the past fiscal year. The activities of your committee during the past 12 months have primarily involved proposals of rule making by Federal Communications Commission and the Internal Revenue Service.

A large number of the Independent telephone companies are exempted from F.C.C. regulations by the Communications Act of 1934 as amended, but they will be concerned nevertheless with a Systems of Accounts prescribed by state regulatory commissions.

The majority of such Systems of Accounts ordinarily originate from rules laid down by the F.C.C., so it naturally follows that any change in the Federal Communications Commission system will eventually find a place into the Systems of Accounts by which state regulatory bodies govern the affairs of the telephone companies subject to their jurisdiction.

With this thought in mind your Accounting Committee carefully studies each proposal with a view toward reducing the accounting burden to which member companies might be subjected. We also give consideration to the problems of management and the effect such changes might have on the interests which it serves. The Committee realizes that some of the problems presented are occasionally of a controversial nature but we are happy to report that on the items dealt with during the past year we have found the Committee in agreement.

**This report was presented at the 1959 USITA Accounting Conference.*

Record Preservation

ONE OF THE first items considered by the Accounting Committee was the proposed rule making adopted by the F.C.C. in Docket 12639 and relating to the microfilming and preservation of records.

The recommendation of the Committee was favorable to microfilming records but recommended that the practice be on a voluntary basis and not mandatory under conditions which cannot be substantiated from an economic practice.

The Commission issued its First Report and Order in this docket on December 19, 1958. It will be noted that favorable action was received on parts of the proposal and we entertain the hope that the Commission will be able to see its way clear to further relax requirements at a future date.

Accounting Changes

THE NEXT matter for consideration was a proposed rule making by the Internal Revenue Service on a proposal which would result in a change in certain cases from retirement to straight line method of computing depreciation for income tax purposes for taxable years beginning

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Gerald Gaydos is one of our barometer watchers at our Chicago "good weather station."

after December 31, 1953. The Committee reviewed the results of the proposal and it was determined that telephone companies were not involved and no comments were filed. This opinion was concurred in by the A. T. & T. Co.

The Committee considered notice of proposed rule making in Docket 12760 adopted by the F.C.C. in the matter of amendment of Part 31 of the Commission's rules and regulations to delete telephone plant account 207, Right of Way. It was unanimously recommended that we concur in the elimination of account 207, Right of Way and the amount included in the appropriate plant accounts for which the right of way is associated. Another consideration involving plant accounts was covered by F.C.C. Docket 12811 to amend Part 31 of its rules and regulations to include in account 234, instead of accounts 231 and 232, the investment in certain SAGE equipment. The Committee expressed its approval of this proposal as we believe it is to the best interest of each company involved to be able to identify certain specialized items of plant used in specific locations.

The more recent items reviewed by the Committee are covered by F.C.C. Docket No. 13149 in the matter of an amendment of Annual Report Form M for Class A and Class B Telephone Companies to review the schedules showing information regarding the investment of pension and benefit funds; F.C.C. Docket No. 13180 in the matter of Amendment of Part 45, Preservation of Records of Telephone Carriers, of the Commission's Rules and Regulations to reduce the retention periods for payroll, employe service, mortality and related records; and F.C.C. Docket No. 13181 in the matter of Amendment of Annual Report Form M for Class A and Class B Telephone Companies, to change the reporting requirements for compensation paid to individual employes.

The Committee considered the proposed rule making in connection with three Dockets set forth above and has filed a recommendation of agreement in connection with Docket No. 13180 and Docket No. 13181. The Commit-

tee also filed a recommendation in connection with Docket No. 13149 expressing agreement and in addition suggesting a provision for filing the required report by a Group Company and the proper reference by the operating companies.

Simplified Station Accounting Procedure

THIS BRINGS us up to date on the current activities of our Committee and now I would like to take a moment and discuss some accounting changes which have been finalized this year.

In 1953 the chairman of your Accounting Committee along with representatives from the A. T. & T. Co. met with members of the Federal Communication Commission and a Subcommittee of the NARUC in New York City on February 26 to discuss a proposal to change accounting methods relating to handling of station apparatus, station installations and drop and block wires.

There followed a number of meetings and a volume of work, and eventually the so called simplified station accounting procedure became a reality. I am not so sure the originator of this title was aware of all the complexities involved or we might have had a slightly different title. To say the least I have heard the procedure called by several less complimentary phrases.

The F.C.C. issued a report and adopted an Order under date of September 19, 1956, prescribing the change in accounting regulations on the handling of station apparatus, service connections, small private branch exchanges and booths and special fittings.

For the companies under F.C.C. jurisdiction this order became effective on a voluntary basis as of January 1, 1957 and mandatory on January 1, 1958. The state regulatory Commissions followed the pattern and in most cases for companies under state regulations this change became effective on a voluntary basis as of January 1, 1958 and mandatory on January 1, 1959. There now remains only the handling of this important accounting change with the Internal Revenue Service.

"Mark Sensing"

DURING THE past year, it has been my privilege as Chairman of the Accounting Committee to be the Chairman of the Sub-committee on Mark Sensing. The additional members of this special committee are Paul H. Henson, Kenneth L. Lawson and D. A. Perigo representing the Engineering, Commercial and Traffic Committees of the U.S.I.T.A.

The increasing use being made of mechanized accounting and billing procedures by both branches of the industry has indicated a need for close coordination between Independent and Bell System operating companies in order to achieve a greater degree of uniformity and standardization of the design and preparation of mark sensed toll tickets.

In order that all companies may continue to interchange toll ticket information it is mandatory that any toll ticket developed for mark sensing have the required information in the same columns on the ticket so that a detecting machine can recognize and make available all the required data.

The first step in coordinating the efforts of the Independent and Bell System companies was a meeting in May, 1958, held in Chicago and attended by the U.S.I.T.A. Accounting Committee and representatives of the A. T. & T. Co. As a result of this meeting, the Accounting Committee, recognized the need for a special committee which would include in addition to accounting the experience and knowledge of engineering, commercial and traffic departments. The Board of Directors saw fit to follow the recommendation offered on the need for a combined effort and the Sub-committee on mark sensing was appointed.

The original meeting of this new committee and A. T. & T. representatives was held in Lincoln, Nebraska in July, 1958. It immediately became apparent that to accomplish the full purpose of the mark sensing program a joint effort and release would be necessary to notify all companies of the necessity of standardization of preparation and use of a mark sensed toll ticket. A great deal of time and effort was employed in arriving at a result which would be acceptable to all of the branches of the industry.

The final draft on this work was completed in April, 1959, and a joint report on mark sensing toll tickets by the U.S.I.T.A. Accounting Sub-committee on Mechanized Operators Toll Ticketing and Bell System representatives was included with the U. S. I.T.A. letter dated May 7, 1959 and distributed to all member companies. The same report was furnished to all Bell System operating companies. Since that date there have been some changes incorporated into the procedure and no doubt additional changes will be required as is necessary with any new developments of any progressive industry.

In closing the Accounting report for the past year, I would like to express my appreciation to the members of the Committee for the fine cooperation and also to the members of the Washington staff, who have been quite helpful when assistance was required.

The members of the Accounting Committee feel that increasing attention must be devoted to the Accounting problems of our industry as we are living in a world in which rapid changes are being made. The development of new techniques and the changed attitude on the part of regulatory groups present a challenge to our Accounting personnel and we must meet this challenge with renewed efforts to evaluate this change for the management people of the member companies in our association.

Respectfully submitted,
Accounting Committee

Wm. H. Todd, Bellevue, O., Chairman,
W. F. Corman, Atmore, Ala.
R. E. Dolar, New York, N. Y.
Keith Vine, Monrovia, Calif.
O. M. Westrup, Mattoon, Ill.
A. I. Weisskopf, Philadelphia, Pa.

EDITOR'S NOTE

The regular TE&M features by Allan Stacey, C. D. Ehinger, John S. Reed, Dr. G. M. Jones, D. A. Perigo and Leo Sands will be in their usual places in the Nov. 15 issue of TE&M.

Engineering Committee Reviews Progress Made in '59

Presented by PAUL H. HENSON*

Chairman,
USITA Engineering Committee

√ ***Report of USITA Engineering Committee summarizes activities of the General Committee and five subcommittees — Radio and Carrier, Direct Distance Dialing, Engineering Education, Transmission and Protection, and New Techniques and Devices.***

THIS IS a report of the USITA Engineering Committee on its 1958-1959 Association year activities. With some degree of pride, we can point to participation in a number of worth-while undertakings, certain of which can be recorded as accomplishments of note. We also trust that plans which have been formulated and implemented will later lead to significant contributions. With this self-imposed pat on the back, we can now report specific activities of the General Committee and the five Subcommittees.

(1) General Committee: —

The General Committee has again occupied this Association year by considering and acting on general engineering problems and attempting to keep abreast of the activities of the Subcommittees. Last year we tried to stay ahead — this year we were content to stay abreast. The general engineering problems were concerned largely with the evaluation of new products and equipment. Several manufacturers sought advice on products and procedures under development. In keeping with Association policy, the principle of operation or design was evaluated and not the end product.

On June 23-24, 1959, a meeting of the General Committee, together with representatives from the Plant Committee and Engineering Subcommittees, was held with Bell System personnel to discuss and evaluate procedures and equipments that will require industry-wide coordination in the near future.

As a result of these meetings, the Committee is now preparing for distribution to Member Companies a series of bulletins on various technical subjects. Those bulletins already issued or now being readied for distribution cover such subjects as 1) Dataphone Service and Facilities, 2) Buried Cable Distribution, 3) PBX Inward and Outward Toll Dialing, 4) Transmission Maintenance, 5) Microwave Radio, 6) Closed Circuit TV, and 7) Numbering Plan Area Codes, Credit Card and Special Charge Calls Handled on a DDD Basis.

It is the consensus of your Committee that if the distribution of such bulletins can be perpetuated, we will have developed an excellent means of alerting Member Companies to operational future planning that will require industry-wide coordination.

The Engineering Committee also participated in the preparation of the Joint Report on Mark Sensing Toll Tickets that was distributed to Member Companies in May. Aside from these specific projects, other Committee activities are reflected in the following Subcommittee reports.

(2) Subcommittee on Radio and Carrier: —

This Subcommittee has been active,

**Mr. Henson presented this report at USITA's 1959 Engineering Conference.*

Standing, Mr. Tony Osterkamp of Santa Ana, Calif.

What do these men have in common?

They're all successful farmers.

They all use extension phones to run their farms.

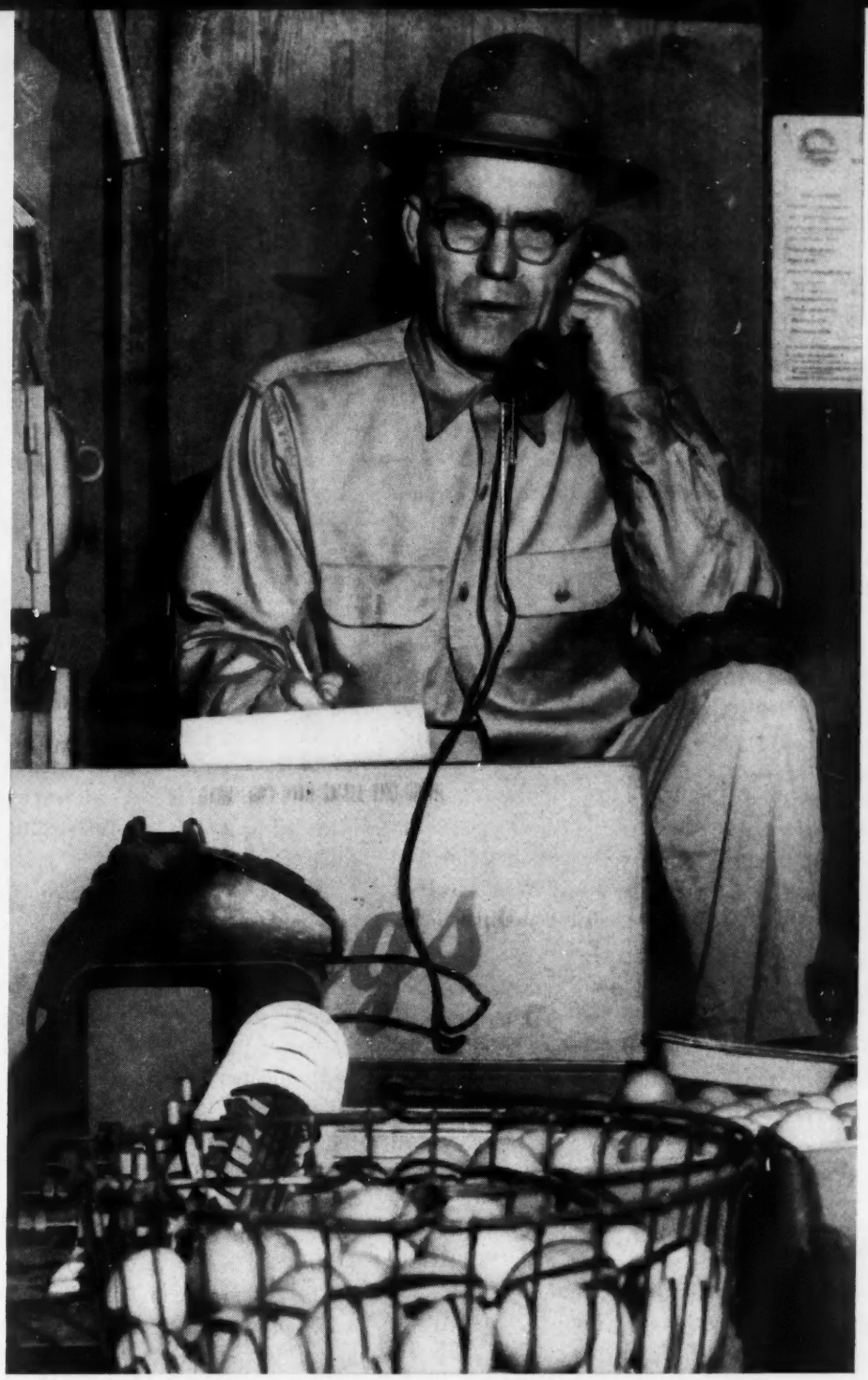
They're three of many farmers who have been featured in Bell System extension advertising addressed to readers like themselves.

Extension phones in outbuildings are important. They are necessary farm tools—to save time, speed crops to market, help run farms efficiently.

In advertising them, we let farmers themselves testify to the usefulness and value of extension phones. They do so in a neighborly, down-to-earth way that's interesting and believable to our readers—farming men and women in every part of the country, served by a great many of the nation's telephone companies.

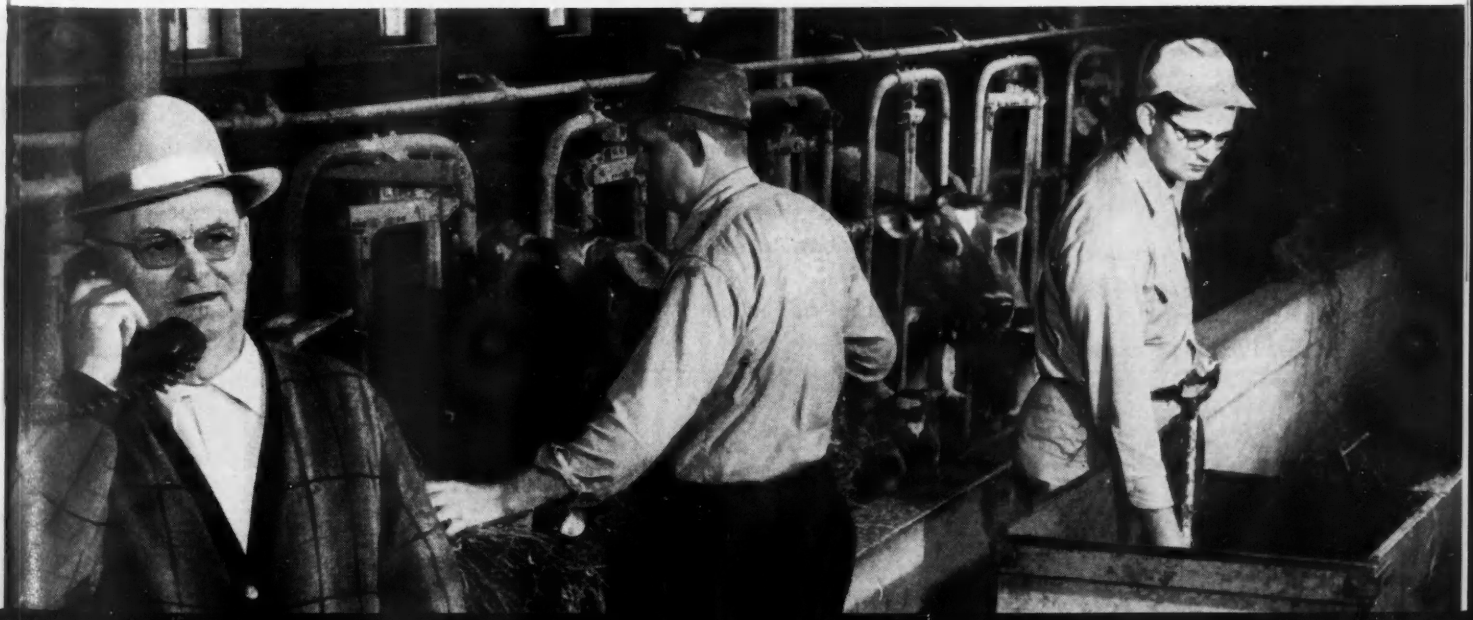
Extension phones on farms are more than a growing source of revenue for the telephone industry. They also offer an opportunity to give better, more useful service to many of our best customers.

BELL TELEPHONE SYSTEM



Mr. Henry Mullins of Gaffney, S. C.

Left, Mr. Chester Folck of Springfield, Ohio



as usual, in connection with Federal Communications Commission matters. Specifically the Subcommittee 1) has participated in hearings and determinations on the frequency band above 890 MC, 2) has done similarly on the fact-findings hearings for the 25-890 MC band, 3) has handled a number of relatively minor FCC actions or proposed actions, and 4) is presently well under way on a Dial Mobile Radio study leading toward the objective of compatability between the systems of various manufacturers. This objective will be realized through the preparation of Minimum Performance Standards for the guidance of both telephone company purchasers and manufacturers.

The FCC Statutory Inquiry concerning allocations above 890 MC was initiated during the term of the former Subcommittee Chairman, Marcus L. Donaldson. Since the initial USITA presentation, the Subcommittee has participated in the preparation of the follow-up briefs and petitions.

The Subcommittee, and particularly Chairman Ross H. Herrick, has assisted in the preparation of an Association presentation to FCC regarding provisions for the 900 MC services displaced in favor of military radiolocation services. The Subcommittee, together with Mr. Thomas R. Warner, radio engineer, and the Association legal counsel presented the USITA position to the FCC in its Statutory Inquiry concerning frequencies in the 25-890 MC band.

Efforts in this hearing were directed primarily toward the procurement of suitable provisions in the 840-890 MC band for microwave point-to-point service. A further effort in this hearing was concerned with land, mobile radio, with emphasis on the need for suitable common carrier provisions.

The Dial Mobile Radio study now in process started with a meeting on August 11-12, 1959 in Lorain, Ohio. A second step was taken at a meeting held in Washington, D. C. on September 15-16, 1959. The meetings served to develop a list of firm system requirements based on the performance features requested by the operating telephone companies that were found to be within the limitations of practicality and economy for the manufacturers.

Later, the Subcommittee will develop Minimum Performance Standards for Dial Mobile Radio systems based on the conclusions of both operating companies and suppliers. It is anticipated that the Subcommittee will later pursue the determination of standards for microwave radio, carrier systems and auxiliary testing equipment.

R. H. Herrick, Chairman
B. L. Arnold
G. F. Orelli

(3) Subcommittee on Direct Distance Dialing: —

A meeting of this Subcommittee with Bell System representatives on September 15-16, 1959 was the only formal meeting held during the Association year. The agenda for this meeting was compiled to cover subjects which required clarification and to invite the disclosure of plans which may affect over-all toll dialing operations.

The meeting further provided an opportunity to review the revisions being incorporated in a new issue of the Notes on Distance Dialing. Typical of the agenda items discussed are the following subjects: (1) Numbering Plans of the Future; (2) Transmission Objectives; (3) Direct Distance Dialing of Person-to-Person, Collect and Special Calls; (4) Access Codes; (5) Protection of Office Codes in Contiguous Number Plan Areas; (6) Office Balance; (7) PABX Inward and Outward Dialing; (8) Alternate Routing Problems; and (9) Supervision and Pulsing Requirements.

The minutes of this meeting will be made available to Member Companies in the near future. Further, at such time as the new issue of Notes on Direct Distance Dialing is readied for distribution, same will be made available to those who require the information in planning for adequate toll service.

The Subcommittee considers such joint meetings to be valuable contributions to the success of DDD and firmly believes that the industry will profit by a periodic exchange of views. DDD is in the process of evolution and new developments which will affect the quality and economy of the service will continue to present technical problems of mutual interest. For optimum results, it is necessary to continue to coordinate the procedures and technical aspects of this important phase of telephony.

L. L. Ruggles, Chairman
C. M. Davis
H. A. Barrows
D. A. Perigo
J. J. Grumblatt

(4) Subcommittee on Engineering Education: —

This Subcommittee arranged for the third annual Telephone Engineering Conference at Michigan State University, East Lansing, Michigan. A total of 45 men registered — the largest class to date. The Conference was held this year from June 28th to July 17th.

The 1959 program varied from previous programs in that the Accounting course was dropped and the over-all course was shortened from four to three weeks. Questionnaires from the previous two Conferences had indicated that Accounting was of little value to this group and shortening the program enabled the University to hold the registration fee to $500.

The faculty was composed largely of the same instructors who have served the Conference on the two previous occasions. Members of the instructional staff included Dr. Gruehr, Polytechnic Institute of Brooklyn; Dr. Fusfeld, Michigan State University, Dr. Dahle, Michigan State University, and Dr. Ryder, Michigan State University. Replacing Mr. Fred Rahdert as instructor in Fundamental Planning was Mr. I. B. Jackson of the General Telephone Service Corporation. Another new faculty member was Dr. Killingsworth of Michigan State University, who presented the Labor and Industrial Relations section.

The experience gained in conducting these Conferences has resulted in improvements each year. We are of the opinion that this is definitely a

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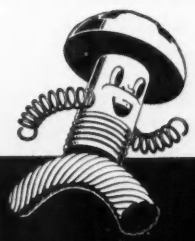

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worth-while activity and should be continued.

R. J. Loveland, Chairman
P. H. Henson
I. B. Jackson

(5) Subcommittee on Transmission and Protection: —

The Subcommittee's primary effort has been directed towards the formation and implementation of additional state level transmission and communication improvement committees. This is a continuation of the program initiated in 1958.

Early this year a memorandum was sent out by the Washington office to all State Association secretaries. This memorandum pointed out that the USITA Board of Directors had adopted the recommendation of the Engineering Committee that state associations be urged to set up committees, particularly in view of the growing need for joint action in connection with Direct Distance Dialing, SAGE Program, and other present and contemplated nationwide government, military, and civilian networks, and Dataphone service.

Ten state associations have appointed either a committee or a chairman to be responsible for this activity. These associations are: South Carolina Independent Telephone Association; California Independent Telephone Association; Florida Telephone Association; Georgia Telephone Association; Illinois Telephone Association; Nevada State Telephone Association; Ohio Independent Telephone Association; Oregon Independent Telephone Association; Pennsylvania Independent Telephone Association; and Virginia Independent Telephone Association. The Missouri Telephone Association has the matter of establishing a committee under consideration.

Following this action the committee prepared the first in a series of information memoranda. The first memorandum explained the objectives of the state committees and suggested that each name the committee the Independent Transmission and Communication Improvement Committee.

The memorandum also suggested a procedure for initiating the functioning of the committee and a committee program which included the assembling of information on, developing coordinated plans, and securing proper transmission in connection with the following: Code assignments and DDD arrangements; Intertoll trunks; Toll connected trunks; EAS and inter-office trunks; and Subscriber loops.

In the memorandum it was also suggested to the state committees that they request the Bell State Manager to appoint a Bell T. C. I. Committee to work with the Independent Committee which has been designated.

This memorandum was developed in cooperation with the Advisory Staff of the American Telephone and Telegraph Company. The memorandum was distributed from the office in Washington to all state association secretaries and Independent T. C. I. Committees, and to all Associated Bell Companies by the American Company.

The committee is continuing to work with the pilot Independent T. C. I. Committee in South Carolina in developing information and suggested projects which will be made available through subsequent information memoranda.

It is felt that these T. C. I. committees can furnish the opportunity to develop the needed cooperation and coordination between the Independents and the Bell System, and between Independents. Such coordination is becoming essential in furnishing a modern, progressive nationwide telephone system. This committee is continuing to encourage those states which have not set up committees to do so and to furnish the inspiration for the committees which are appointed to realize the opportunity and obligation which exists for them to make a substantial contribution to the orderly development of such an essential service in the nation.

Frank S. Barnes, Jr., Chairman
R. E. Lawrence
G. F. Orelli
M. C. Royalty

(6) Subcommittee on New Techniques and Devices: —

This Subcommittee has considered several methods of meeting its responsibility to Member Companies. It has been concluded that major and significant techniques and developments should receive the attention and study of the Subcommittee as opposed to minor advances or contributions in the way of improved tools, testing equipment, plant materials and component parts.

In conjunction and cooperation with the General Committee, it is anticipated that this Subcommittee will assist in the preparation of Engineering Committee Bulletins on certain subject areas. Toward this end, the Subcommittee is presently making a preliminary evaluation of the economic and engineering aspects of electronic switching. As this or other subject area investigations are completed, detailed reports will be prepared for distribution to Member Companies.

Ray Blain, Chairman
G. F. Orelli
H. N. Hammond

From the above reports, it can be seen that the 1958-1959 Association year has been a busy one for all serving on the Engineering Committee. We trust that some of the work has been constructive.

It has been an honor and a pleasure to serve the Association during the past year. The assistance and cooperation of all concerned is gratefully acknowledged.

Respectfully submitted,
P. H. Henson, Chairman
R. J. Loveland
W. T. Pitbladdo
F. D. Reese
A. A. Wilson

"Traffic Economics"

(Continued from page 32)

perience tables. It has been very difficult for us to find operators to fit the table — therefore, we don't use an experience table.

The only item of experience which we measure is one that is purely arbitrary in that we divide our operators between those with less than six months or more than six months service. Actually this has nothing to do with our force adjustment and is merely the point at which an employe moves from a probationary status to a permanent employe under our agreement with the Union.

We believe six months is a fair trial period in which to judge our selection of people and if there is indication that an operator may not make the grade we take the necessary action before the expiration of six months and thereby eliminate a lot of complications.

Where this plan is followed religiously by our local managements we know that we have the "right people" and the experience table then becomes unnecessary. In our general office we maintain charts and graphs of the offered traffic on a weekly basis. We find the weekly trends of the past are surprisingly accurate in forecasting the future. The level changes but, for the most part, the *trends* are constant.

We use this method as a basis of estimating the right number of people. We arrive at the right number by analyzing the number of tickets written per operator hour.

The number of tickets per operator hour is carefully plotted with the answering time results. In other words, we estimate the number of tickets per operator hour on the basis of a six second average answer. Obviously, the estimated toll tickets divided by the number of tickets per operator hour indicates how many hours are expected to be required.

This part of the job is done in our general office and we then let the chief operator know how many hours per day are expected. We do not tell her at what hours of the day she should use these people. We pay our chief operators a satisfactory salary and in turn expect from them satisfactory management results.

We believe the chief operator can assign the total number of hours required on the basis of her intimate knowledge of the day-to-day requirements both from the standpoint of fluctuating traffic and from the standpoint of the people whom she has available.

For example, the chief operator may know from her local experience that on a Monday she requires one more person in the morning busy hour than she does on other days of the week. Likewise, there may be afternoons when she needs less than the regular schedule.

Taking care of these conditions is the responsibility of the chief operator. We believe there are many times when top management people are surprised and shocked at how well people down the line can accept responsibilities if they are given the authority to go with those responsibilities.

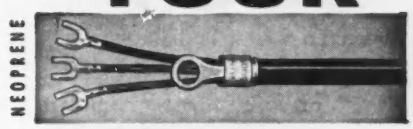
Training

OUR NEXT item has to do with training — and by training we mean at all central office levels from the chief operator to the initial training of the new employe. Time does not permit going into the details of our training program, but I want to mention two items in connection with it. The first item does not even require any argument. It is obvious that the well-trained person can do a much better job than one who is not properly trained. The second item that I'll mention here is that all training programs require constant analysis and review to make sure they fit present day conditions.

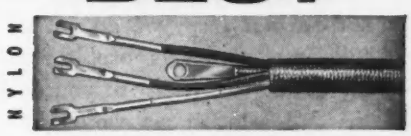
For example, by giving our traffic training supervisor the time to think and analyze, as well as to plan incidental training following an initial training course, she was able to re-

CORDS BY Runzel

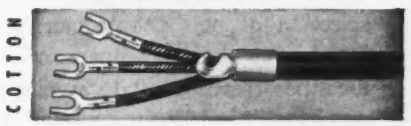
YOUR



BEST



BUY!



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duce our initial operator training course from 15 days to 12. This means that each time we train a class of two operators we save over $100.

There is also additional benefit which sometimes has an effect on our service and that is that we are sometimes under pressure to provide additional people. By having a training course of 12 days instead of 15, it is possible through the employment of one day overtime each week to provide the additional operators in two weeks instead of three. We, therefore, say that training is a substantial item in Traffic Economics.

Force Losses

AS TO THE subject of force losses, or force turnover, and its effect on the economics of the Traffic Department, I'm sure you will not be surprised if I say we do not have a full answer to this problem and I might add that if any of you do have the full solution we would be glad to hear it.

We do know, however, that careful selection of new people can help a lot. In most of our operator office localities there are state employment service offices. We use these offices to full advantage by having them give aptitude tests to our applicants for operator positions and, thereby, do the first screening job for us.

Through the use of this service we have cut down considerably the number of interviews required by our employment people in appraising applicants. In addition to aptitude one of the things that we have learned to look at very carefully is the possible permanence of the applicant. For example, we would not expect much permanence from the wife of an itinerant mill worker who is living in a motel or trailer camp.

There have been times when we have had no normally acceptable applicants in some of our areas. Our experience has been that when we hired the best of the normally non-acceptable ones we wasted our money — the training was useless, the supervisory requirement burdensome, etc. We are convinced that our service would have been better if we worked one shift short or scheduled overtime than it was by filling the operator requirement with a misfit.

Every once in a while we find that force losses occur as the result of poor supervision in the office. It seems almost impossible for this to happen, especially when we are very selective in picking our supervisors and when we train them thoroughly.

We simply must remember that we are all human and as such we are subject to all kinds of moods. It is possible to have a very fine supervisor in all respects and then find that, as a result of some personal troubles which are bothering her, she can rather quickly reach the point where she is a menace to the office, because her personal troubles have been carried to the job and, therefore, interfere with her treatment of subordinates. Several losses may occur before someone gets real honest and tells us the real reason for leaving. This, then, is another area to watch carefully in connection with force turnover.

Incidental Absence

SINCE THE Traffic Department works on the basis of every manual call being hand-tailored to suit the requirements of the customer at the time it is handled, the absence of one operator may be exceedingly important to the service within the office.

Incidental absences lead to the necessity of call-ins and the call-ins may require the payment of premium time and may also result in schedule changes later in the week. Even if this were not the case the additional time spent by the chief operator or traffic clerk is time when something more constructive could be done. We pointed out the requirement for permanent employes while discussing the subject of turnover.

Here under the subject of absence control we find associated items such as good health being a requirement and also in the matter of selection is the case of the young mother with her baby sitting problems when she is at work. We know that if she cannot get someone to stay with her children she will not be on the job.

A third item in this connection is the matter of interest in the job and interest in the subscribers so that operators do not permit minor items to cause them to be absent from the office.

Customer Instruction

ONE of the primary objectives of a customer instruction program is to be sure that PBX operators and other large users understand our operating practices and cooperate with us in placing their calls. A poorly trained PBX operator can cause a great deal of lost time at our switchboards simply by the way she places calls, putting a burden on our operator to get all the call details straightened out.

Another item that enters into the customer instruction program is that of charge quoting. Whenever reductions can be made in the number of charges quoted to the customer we can reduce our expenses in the Traffic Department. We make every effort to have the customer do his own internal bookkeeping controls. This becomes a very serious task when, for a long period of years, a company has given the PBX customer just about everything he has asked for.

We find, however, that in building up the confidence of the customer in our methods that he is more likely to go along with our normal ticketing and billing procedures.

A very thorough customer instruction program is a must when you shift from operator handled traffic to customer dialed. DDD has no value to the operating company unless the subscribers use it.

This reminds me of the story of the sales manager for the dog food company who was giving a pep talk to his salesmen and, after pointing out all of the wonders of their dog food, suddenly said, "Then why is it that our sales production is at the bottom of the list of all the dog food companies?"

He was amazed when one salesman got up and said, "Boss, I think maybe it's because the dogs just don't like it."

The same thing applies to DDD. If we don't have people liking it they won't use it and if they don't use it

we can't make money on it. Therefore, a good solid customer instruction program will pay us dividends.

Dial Office Management

DIAL OFFICE management is a very important traffic function and one on which it is rather difficult to place a measurement in dollars and cents. One of the principal parts of this program is that of line and terminal allocation.

Perhaps use of the word allocation is new to you. We use it to differentiate from line and terminal assignment as used in our Plant Department and which covers other items. As a matter of fact, we had a couple of old-time line assignment men in the Plant Department who showed some resentment about the Traffic Department making line and terminal assignments, but when we changed the designation from "assignment" to "allocation" they were all in favor of the program.

You will recall that at the outset of this talk I stated it was the responsibility of the Traffic Department to try to complete all offered calls regardless of how they were handled, whether by an operator or by customer dialing. We feel very strongly that through the proper allocation of lines and terminals (thereby creating load balance throughout the dial units) the Traffic Department is contributing materially to the grade of service rendered in our dial offices.

We have many instances where the Traffic Department has been able to reduce the number of switches at various levels of the machine due to properly balancing the traffic through the machine. These savings, of course, show up in the investment and the expenses associated with investment. Probably the most important effect is that all of our subscribers receive substantially the same grade of service.

In other words, if we are short on equipment some place in the office we still have the equipment balanced and everyone's service is then of the same grade. We have eliminated the cases where one group of subscribers has very poor service and all of the other people in the office have good service.

Statistics

MY LAST ITEM concerns statistics and the part a general office plays in the economics of the Traffic Department. Statistics, records, or whatever you choose to call them, become important because they represent the only method by which you can appraise the results that are being accomplished. This does not mean that a lot of records are required. It has more peculiar reference to the quality of the records, those which are easily understood and interpreted.

Our general offices are responsible for methods and results and the only way to find out what is going on is through the statistics. Some items of work in the general office must be accepted as necessary. For example, the issuing of general instructions, the review of operating practices, processing of rate and route information, etc., cannot be avoided. We do not employ people in the general office for the sake of creating jobs or for the purpose of doing things because some other company does them.

Our statistical system has two primary objectives. The first is to keep top management informed concerning service and costs. To illustrate this I can tell you that for 12 months ending July 31, 1958 our company average answer on CLR was 5.9 seconds and for the 12 months ending July 31 this year it was an even 6.0 seconds. The cost per thousand units last year was $13.82 and this year $13.24.

The second objective is to assist our field forces to meet our service and economic objectives. You have, of course, recognized that with an average answer for the company of 6.0 seconds some offices were above and some below. The relation of speed of answer to tickets per operator hour, which I mentioned under Force Adjustment, is reducing costs in some offices and improving service in others.

Summary

YOU WILL recall that early in this talk I said that the discussion would be based on the results of our own experience in the West Coast Telephone Co., and it does not necessarily follow that you should do these things as we have done them.

However, in the matter of Traffic Economics if careful attention is given to the cardinal points of service objectives, force losses or turnover, absence control, customer instruction, dial office management, and the use of statistics, surely better results will be yours.

Perhaps it is a little odd that you have a general manager talking to you about traffic matters, but why not when it consumes 27¢ of our expense dollar? And it's pretty hard to find any manager who isn't interested in expense control, whatever the department.

This brings me to just one last thought: In the West Coast Telephone Co. we do not have a most important department. We have only departments that are needed in the operation of our business, and each of these departments is dependent on all of the others. We firmly believe that the success of a company is dependent upon successful departments and each one must constantly develop and apply proper economics to its operation. — *L. G. Beck.*

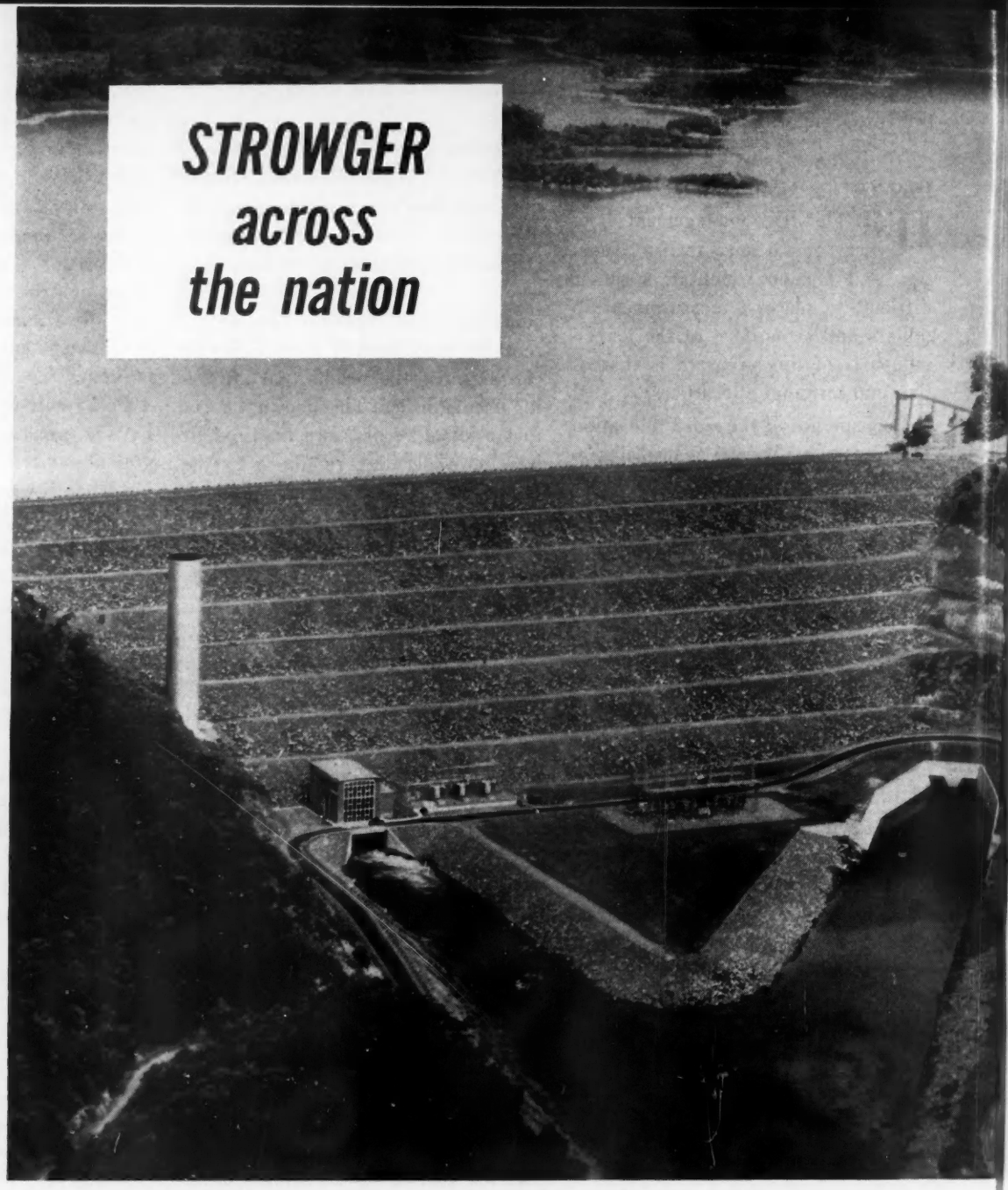
Product Information Kit

PRODUCT information on a new one-piece Communications Tie, developed by Preformed Line Products Co., is available in the form of a three-section CT Information Kit.

The first section of the kit, (No. 81-200), is of specific interest to chief engineers, methods and practices engineers, outside plant engineers, construction superintendents and purchasing agents. It is a "fact" brochure covering installation and performance advantages of the one-piece tie.

Included in the Information Kit is a step-by-step illustrated Application Procedure (No. 81-300), written to familiarize construction crews with new method of achieving a "good tie" with uniformity of application every time.

Write Preformed Line Products Co., 5349 St. Clair Ave., Dept. TE&M, Cleveland, Ohio.



SOUTH HOLSTON DAM is just seven miles from the city limits. The dam, one of several major developments that have taken place in Bristol since 1940, forms a lake with a shoreline of over 200 miles.

BRISTOL, VIRGINIA TENNESSEE

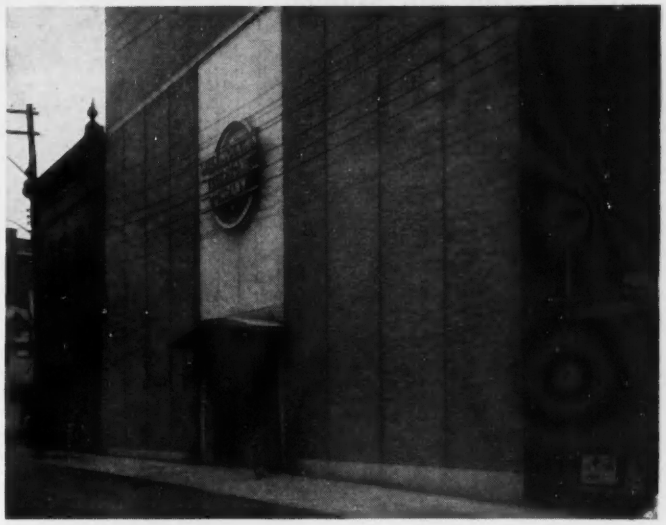
A state line bisects main street to make two cities in one but Bristol leads its double civic life in complete harmony

Straddling the Virginia-Tennessee border, midway between the Shenandoah Valley and Great Smoky mountains, is the city of Bristol. This is the largest city in America with a state line dividing its main business street. Visitors to Bristol will find two separate city governments, two police departments, two fire departments—in fact, there's just about two of everything.

Bristol's economic progress is assured by geography; a pivotal position among five states makes it the trading center for over one-quarter million people. Bristol is also the northern gateway to the booming Tennessee Valley, home of the atomic bomb. The city has three colleges, over 60 industries and a population of approximately 42,000.

Bristol is served by Inter-Mountain Telephone Company. Each day Automatic Electric step-by-step switches work behind the scenes to give dependable, low-cost telephone service. Yes—whether you are in Virginia or Tennessee—Bristol is another success story of Strowger Across the Nation.

LIGHT BURLEY TOBACCO is one of the two principal agricultural products (the other is livestock). Burley tobacco is cured by sunlight and air. After curing, stripping and sorting, the tobacco leaves are taken to an auction warehouse for sale. Burley tobacco is annually produced and sold by the millions of pounds.



INTER-MOUNTAIN TELEPHONE COMPANY recently built this three-story building to house the Bristol business office and exchange. The exchange, with a total of 10,000 lines, converted to dial in October, 1958. Inter-Mountain chose Strowger Automatic to make its conversion. In 1959, SATT equipment will be installed.

MISSILE COMPONENTS are manufactured at the new Raytheon plant. Other industries include metalworking, chemicals, pharmaceuticals, hosiery, electronics and woodworking. Among the many products manufactured are trailers, mine cars and calculating machines. Wide diversification of industry in Bristol assures stable growth.

KELLEY McNISH (holding handset), president, Inter-Mountain Telephone Company, welcomes visitors to Bristol cutover ceremony. On hand were (left to right) D. H. Deaver, president, AE Sales Corporation; R.W. Michie, vice president, Chesapeake and Potomac Telephone Companies; Mr. McNish; Arnold Pearson, AE staff engineer; J. B. Morrison, president, Chesapeake and Potomac Telephone Companies; and H. C. Smith, vice president, AE Sales Corporation.

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A NEW edition, the fourth, of the Transistor Manual has been published by the General Electric Company. The book contains 227 pages of completely rewritten information on transistors and their use in electronic circuits.

Included in the twenty chapters is information on basic semiconductor theory, transistor construction techniques, biasing, switching characteristics, transistor radio servicing techniques and several chapters on circuits.

In addition, the book contains a revised and up-to-date listing of all American JEDEC-registered transistor types with their basic specifications and interchangeability information.

The manual is priced at one dollar, and may be obtained by writing to the *General Electric Company, Semiconductor Products Department, Charles Building, Dept. TE&M, Liverpool, New York.*

Geigy Introduces New Herbicide

GEIGY AGRICULTURAL Chemicals, Division of Geigy Chemical Corp., has introduced another new triazine herbicide, Prometone 25E, for nonselective or industrial weed control in noncropped areas.

A postemergence herbicide, Prometone 25E (known also as Methoxy Propazine and G-31435), is a chemical relative of Geigy Simazine and Atrazine herbicides. A 25% emulsifiable solution, Prometone 25E controls most annual and many perennial weeds and grasses. It appears especially promising for control of Johnson grass and Bermuda grass.

The top killing activity of Prometone 25E combined with its action through root absorption makes it an important addition to Geigy's line of triazine herbicides for industrial weed control. Because of this dual activity, Prometone 25E is most effective when applied within two to three months following weed emergence and when there is adequate rainfall to move the chemical into the root zone.

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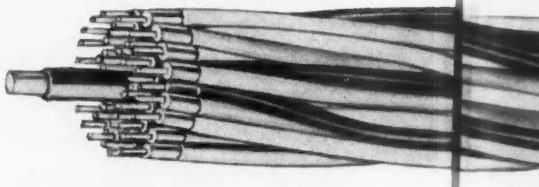

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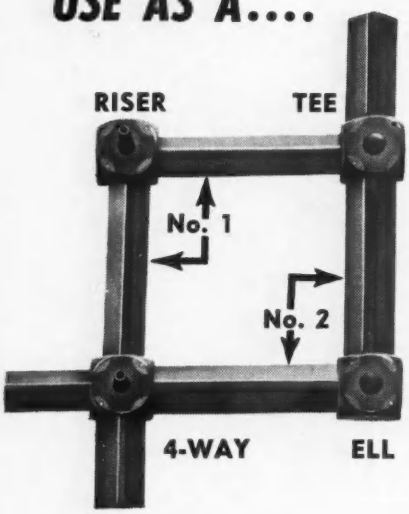

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Management's Responsibility for Safety

(Continued from page 34)

ment, imposes some hardship upon them they will bring the matter to the attention of the supervisor and not take unnecessary chances or deviate from instructions they have received.

As part of the indoctrination, pictures of common violations of safe working practices should be shown to fix the ideas being expressed.

This instruction can be given by people within the personnel department, by the department head, or one of his supervisors. It should not necessarily always be the function of the safety administrator.

(2) *The Development of Operating Rules*

Accident prevention is primarily the process of checking for the existence of unsafe conditions or unsafe work performances. There should be no reservation in any supervisor's mind as to what are the important instructions as related to the people under his or her direction.

Each job should be studied and specific rules developed that reflect the experience of individuals plus the knowledge gained from past accidents. Studies made with the standard list of accident types in mind will bring to light many serious potential causes that can be made the subjects of rules or instructions.

(3) *The Instructions of Supervisors*

We cannot assume supervisors will automatically assume a full share of responsibility for their part in an accident prevention program. They frequently have mental reservations about any statement that says that they are responsible for the accidents occurring in their departments.

For example, supervisors often fail to understand the close relationship of accident prevention and performance efficiency. They labor under the false impression that accidents are bound to happen and not much can be done about it. They ask "what more can I do than to tell a person how to do his work?" They do not

USITA Plant Conference Speaker RALPH J. CROSBY, assistant vice pres., Marsh & McLennan, New York City.

appreciate the opportunities they have to see accidents in the making.

For example, the investigation of an accident is a procedure in which the participation of the immediate supervisor of the employe involved can be of primary importance. But if the supervisor feels the investigation is for the purpose of attaching blame or if he feels that because he was not an eye witness to the occurrence he cannot investigate it, then we lose the benefit of his experience.

In order to overcome these obstructions, supervisors should receive instructions that specifically explain the importance and practical approach to each part of the program as it affects their daily activities. If supervisors are to inspire their men to a higher concept of working safely, the first step is to build their conviction that it can be done. The biggest roadblock to improving the attitude of the worker is the foreman's disbelief that it can be done.

(4) *Inspections and Observations*

As has been mentioned, checking for the detection of accident causes is a prime requisite for effective accident prevention. A procedure must be established for making such inspec-

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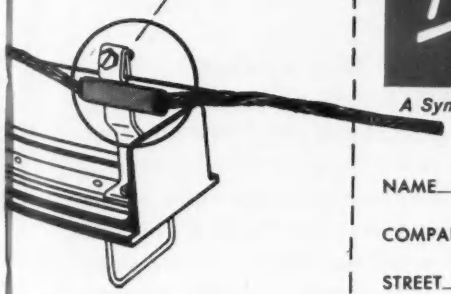

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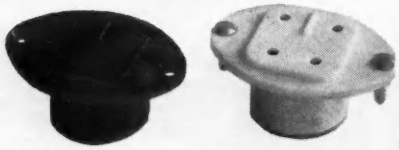

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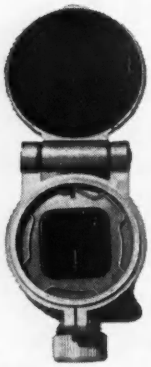

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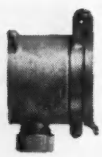

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tions not only by the safety administrator but by someone within each department. The inspections should not be limited to physical or mechanical hazards but observations should be made of employe performance to assure that instructions are being followed. The operating rules and the causes of past accidents offer an excellent guide for the supervisor who is sincere in his efforts.

The procedure should make it clear that often a single observation or check of a person is not sufficient to get a true pattern of his performance. It may be necessary to make frequent, random observations before a supervisor can be reasonably certain his instructions are being followed.

When the investigation of an accident discloses that an employe failed to follow instructions it is reasonable to conclude the previous checking was adequate. We cannot take it for granted that just because accidents are not occurring the rules are being followed.

(5) *The Reporting of Accidents*

A procedure must be established for the reporting of all accidents regardless of the severity of the resulting injury or loss.

But in so far as injuries are concerned, when they require only first aid treatment sufficient information should be recorded in the daily log to enable a qualified person to review the data and determine whether or not the occurrence warranted a more thorough investigation. As we observed from a consideration of the factors in the accident sequence, it is the severity potential represented in the accident cause rather than the extent of injury that should influence our action. Often, the causes of major and minor injuries are the same.

(6) *The Investigation of Accidents*

A definite procedure must be established for the investigation of all accidents. This is something more than the reporting of the occurrence. Our objective is to learn what we can from the accident so effective corrective measures can be taken to prevent a reoccurrence from the same cause.

Since we depend upon the supervisor to control employe performance or conditions under his charge, he should be the one to make the investigation. An accident is evidence that something has gone wrong and it is rightfully a supervisor's responsibility to control any occurrence that interferes with planned operations.

Moreover, there is no more effective means of convincing a person as to what was the cause of an accident than to have him personally dig in and find the facts himself. Accident investigation is a fact-finding process that enables us to tighten up existing controls or initiate whatever new instructions might be necessary to prevent a similar accident.

(7) *Correlation of Accident Data*

A procedure should be established that will require the safety administrator to correlate the accident data required from the investigation reports in a manner that will focus attention on unfavorable trends or outstanding accident causes.

A simple means of accomplishing this objective is to tabulate accidents by agency and cause for each department. The agency can be interpreted as being the object, equipment, job, or area that best identifies where to look for evidence of the same cause that has already produced accidents.

Such a tabulation is a perfect guide when making check inspections or for recognizing the repetition of a cause especially when the severity of injury or loss is not great enough to attract much attention or to make much of an impression.

It can also be used to advantage when a department head has occasion to talk to a supervisor about his performance or lack of performance in controlling unsafe work methods.

(8) *The Control Unit*

Management should establish a procedure that will enable the safety administrator to make direct contact at a level where executive action can be taken when the need arises. This control could be an individual or a group but in any case it should have the

authority to make decisions and to act when facts are presented.

The safety administrator for example may find from his study of the accident data that the action taken to correct certain causes is inadequate. The department head or supervisor may have done all within his authority. There might be the need for a major expenditure or the change of some standard practices. The procedure should make it possible for the safety administrator to bring these facts to the attention of management without red tape or delay and have a decision made as to what will be done to control the situation.

The control unit should also be the place that a progress report would be considered. Certain activities affect the over-all accomplishment of the accident prevention effort to a much greater degree than others.

When weaknesses in the program are recognized, they should be evaluated from the point of view of how much an improvement should affect the over-all performance.

This report of progress prepared periodically by the safety administrator should submit not only statistical data on accident frequency trends but should provide a continuing evaluation of the effectiveness of existing procedures which will identify the outstanding problems that deserve preferential treatment. The report should indicate the action that is being taken and the progress or reasons for lack of progress in solving the problem. This will give management the opportunity of supplementing the action if necessary.

(9) *The Accident Prevention Administrator*

The function of the Accident Prevention Administrator is not truly a procedure in the same sense as the other items which have been covered. However, his function is so often misunderstood that it should be clearly stated when the program is initiated.

Establishing an accident prevention program means more than outlining the procedures. The program must be explained. Individuals in supervisory positions must be coached after they have received their indoctrination instruction. The procedures themselves must be re-evaluated at frequent intervals and management at operating levels requires a helping hand to carry out details of the program. These are some of the functions of the administrator, who should be in a position where he is identified as a direct representative of top management.

It is his responsibility to: (1) recognize weaknesses either in procedures or individuals and be able to bring the situation to the managers' attention for action; (2) analyze accumulative records and select items of major concern for consideration by management; and (3) uncover any unusual difficulties encountered by operating heads and, if necessary, bring the facts to a higher level.

The administrator's job is not a policing action in the sense that it is his responsibility to find all of the unsafe conditions and observe all of the unsafe performances and have all of the solutions. However, it is a policing job in so far as keeping management informed as to the progress or reasons for lack of progress.

The accident prevention administrator is management's advisor. He must, however, always be conscious of the fact that management's interest must be stimulated periodically and to this end he should constantly present material that proves the growing value of the accident prevention program.

When we have a program established along these lines we have something to shoot at. Each procedure identifies an area of activity that lends itself to continuing improvement.

Most of the activities are of such a nature that it is not anticipated complete satisfaction will be achieved quickly. In some instances progressive improvement will require an extended period of time.

Because this is true, it is important that we stress the importance of management's maintaining its interest by checking on performance.

With such information available, management can take action to correct unsatisfactory situations and thereby continue to demonstrate its interest. — *Ralph J. Crosby.*

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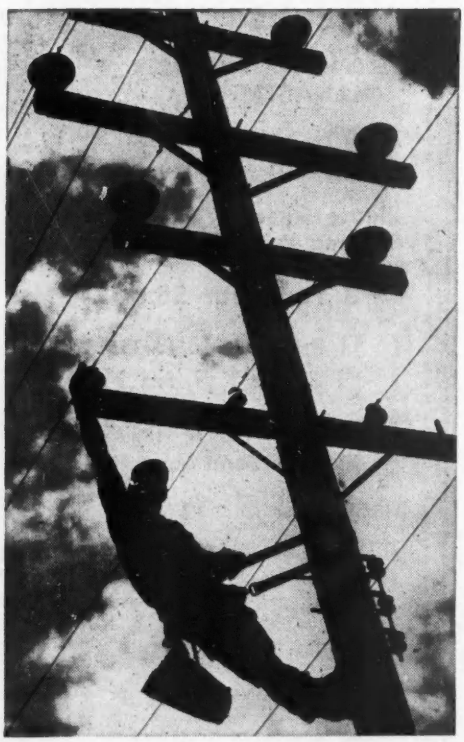

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"Rural Development"

(Continued from page 36)

I have been informed that to ultimately reach the saturation point of telephone subscribers, the rural communication system in the United States is only 30% completed.

Our company is one of the oldest R.E.A. borrowers and because of that fact one of the largest. I speak for all officers and employes in offering our congratulations to Administrator Hamil and his splendid staff for the very efficient administration of the Congressional intent of the R.E.A. Act on their 10th anniversary, October 28, 1959.

Personally, I would rather operate under an R.E.A. loan than under most bank mortgages, regardless of interest rates, sinking fund and equity requirements and provisions for depreciation and maintenance. The reason: — No one knows the rural telephone business on a national scale better than Administrator Dave Hamil and his most efficient staff. Naturally, the independent companies, R.E.A. borrowers and non-borrowers claim some of the credit for the R.E.A. success through the advice and guidance of the R.E.A. Consulting Committee and the splendid cooperation of all segments of the telephone industry. — *Elnathan Gates.*

Application Procedure Booklet

NEW pocket-sized Application Procedure booklet containing instructions for the installation of Preformed splices on messenger strands, guy strands, ground wires, and open line wires is now available from *Preformed Line Products Company, 5349 St. Clair Avenue, Dept. TE&M, Cleveland 3, Ohio.*

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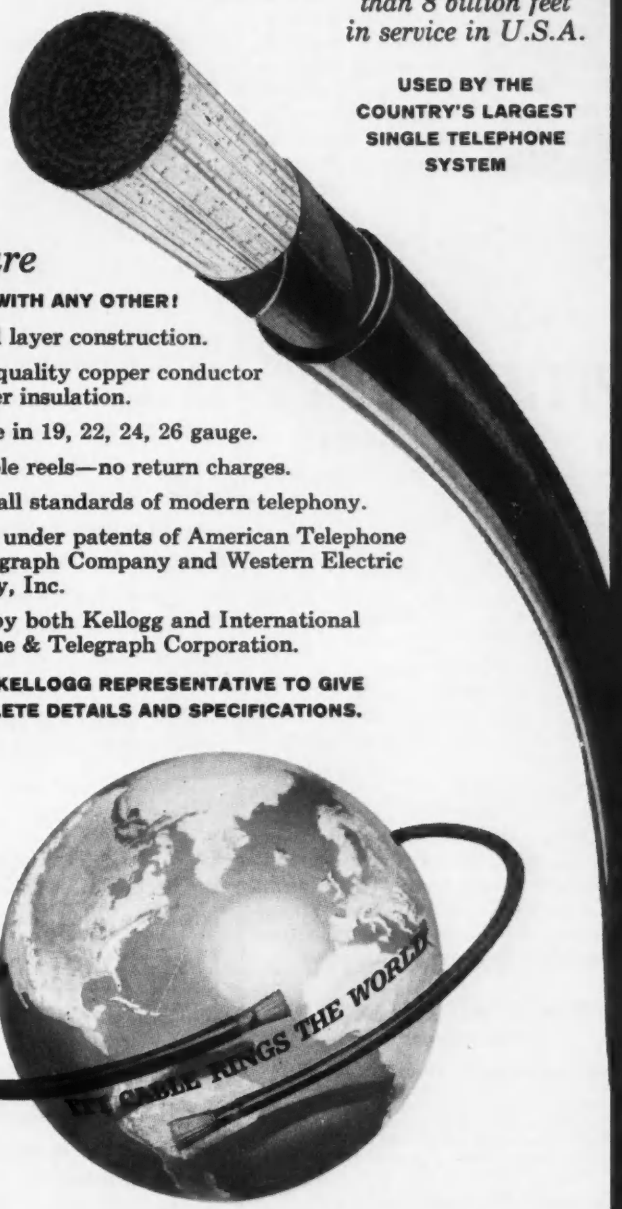

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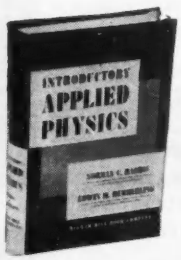

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The "Why" of Traffic Engineering

(Continued from page 38)

rather than direct revenue-producing or cost-saving. Examples of these would be items such as improved trunking to reduce lost calls, or conversions from terminal-per-line to terminal-per-station equipment.

Provision Of Equipment

IN ADDITION to planning and economic selection is a group of activities which we can assemble together under the general subheading of *provision of equipment.*

We have already stated, in our "broad definition," that Traffic Engineering is responsible for recommending the provision of adequate equipment of optimum types, when and where needed, to provide satisfactory, yet economical, grades of service to the customer. Such recommendations are usually in the form of "Traffic Orders" which pass through lines of organization for review and approval by designated officials. A common arrangement would comprehend approvals by the General Traffic Manager and Chief Engineer, with final authorization by the President or Operating Vice-President to proceed with the work.

The provision of equipment is, however, something more than just the preparation of Traffic Orders. Related activities include collecting and analyzing data on past and present traffic volumes and distributions, and from these, preparing estimates of future traffic, which in turn provide the bases for the Traffic Orders, or specific recommendations for equipment additions, rearrangements, and modifications to provide a given grade of service. As a part of this work, Traffic Engineering will also participate actively in the decisions which fix the grades of service to be used as engineering objectives.

Traffic Engineering will also keep in touch with the progress of projects which it initiates to see that service is adequately protected during installation, and that if major changes occur in demand after the original orders are issued, corresponding changes in the equipment to be provided are made as soon as is practicable.

Administration

UP TO NOW, we have listed activities specifically related to additions and changes in the equipment. There are other activities which take place both in growing and static situations, and which come under the heading of *administration.*

Principal examples of administrative engineering duties are trunk administration, and trunk and line assignment. Trunk administration consists of studying past and present trunk and toll circuit usage, estimating future requirements, and adjusting the number of trunks and toll circuits to provide for the flow of traffic. Routing considerations are, for obvious reasons, an integral part of this job.

Trunk and line assignment consists of specifying the location of trunks and subscriber lines in the equipment in such a way as to insure ease of operation and optimum distribution of traffic loads. These may be duties of Traffic Engineering, or they may be done by field forces. Wherever done, they are based on Traffic Engineering studies of load balance.

Other Responsibilities

FINALLY, there will be a group of responsibilities, not necessarily minor ones either, which we shall consider as *other.*

For the most part, these are responsibilities which are carried out in cooperation with other departments. Included are items such as cooperation with the Traffic field forces and the General Engineering Department in arranging for adequate space for Traffic quarters, including operating rooms, lounges, locker rooms, quiet rooms, cafeterias, etc., and in seeing that safety conditions, privacy and protection of personnel are adequately taken into account.

Certainly not the least of the "other" duties of Traffic Engineering

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is to coordinate collecting and summarizing the traffic studies which are such a basic part of your company's separation studies for division of revenues for rate cases. I am sure that you are very much aware — but still it needs repeating for emphasis — that your whole profit position as a company may well depend on the accuracy of the separation data which you furnish to your Chief Engineer for his cost studies.

To summarize, then, the sub-divisions of the Traffic Engineering function consist of the five items: Planning; economic selection; provision of equipment; administration, and other.

And, that's the story. For reasons which must be obvious to you, it has been condensed and a great many of the details of the job have been omitted. Nevertheless, I am hopeful that it has been sufficiently inclusive to demonstrate to you the present and growing importance of your responsibilities in this field, and the need for an adequate and competent organization to do the job.

Let me pause right here and add that when I use the word "competent," I do not limit the meaning of the word to the technical phases of the job. You must have noted that your Traffic Engineering group, as described here, is a sort of "in between" group, and that cooperation with other departments is an important part of its activities. For this reason, let us be perfectly clear that a very definite part of what we mean by "competent" is the ability to work with others.

One final remark and I shall be through. I wish I could promise you that you can do this job cheaply, but I cannot do so with a clear conscience. The caliber of manpower required to do the job is high, and in demand, so the competition is keen.

I would warn against attempting to compromise with less than the best you can obtain, for if you do, it will undoubtedly be reflected in the quality of your service, where the unseen costs can be far greater than the direct costs. More often than not, the technical skill of competent manpower will more than compensate for tangible costs, while the skills of "working with others," good planning, etc., constitute immeasurable intangible assets, and these are the things that keep the seas from boiling and clip the wings of pigs. — *Don Childers.*

Semiconductor Directory

ALLIED RADIO Corporation has announced the publication of edition #5 of the Allied Semiconductor Directory.

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Requests for this directory and subsequent issues may be sent on company letterheads to: *Allied Radio Corporation,* 100 *N. Western Avenue, Dept. TE&M, Chicago* 80, *Illinois.*

Semiconductor Diodes

A NEW characteristics and replacement guide for semiconductor diodes has been made available by Sylvania Electric Products Inc.

The new 12-page booklet contains complete data on the ratings and electrical characters of all Sylvania types as well as a replacement guide to virtually all Electronic Industries Association registered diodes.

The booklet features a section on Sylvania's latest diode manufacturing equipment including the company's recently announced digital automatic tester and classifier which verifies up to 16 separate parameters.

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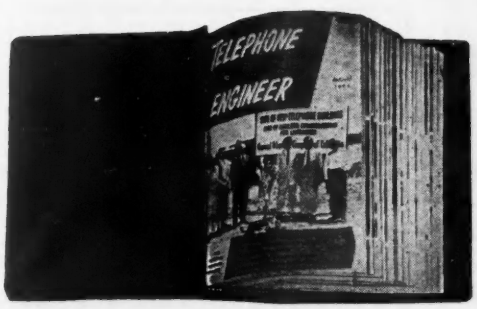

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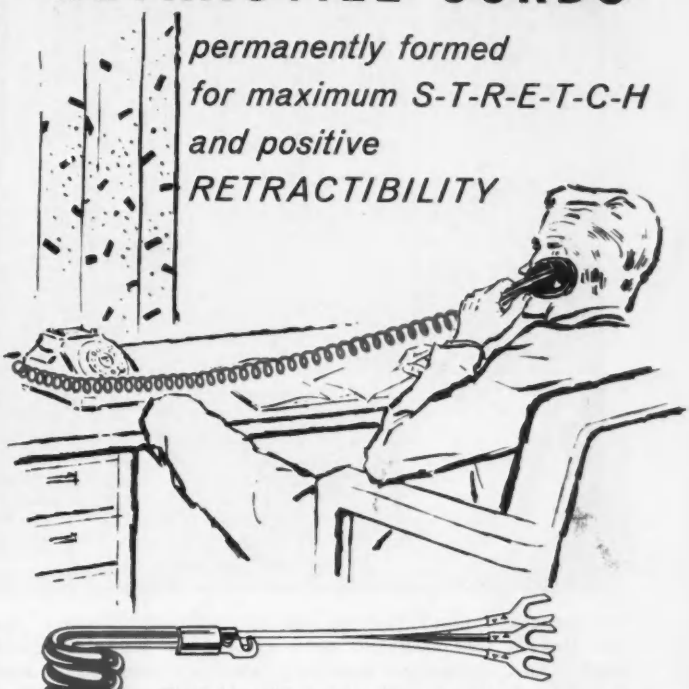

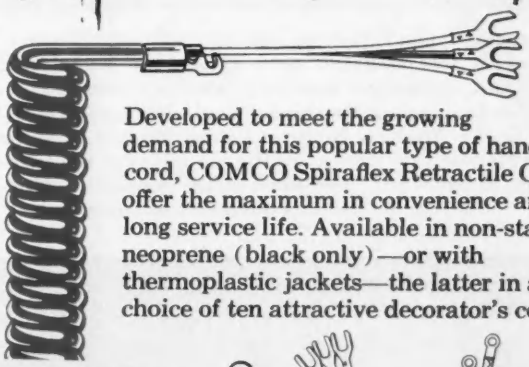

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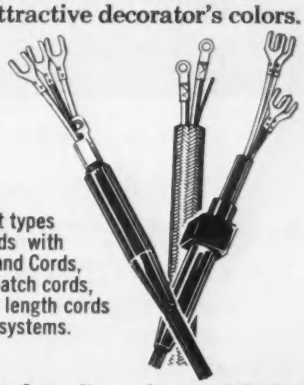

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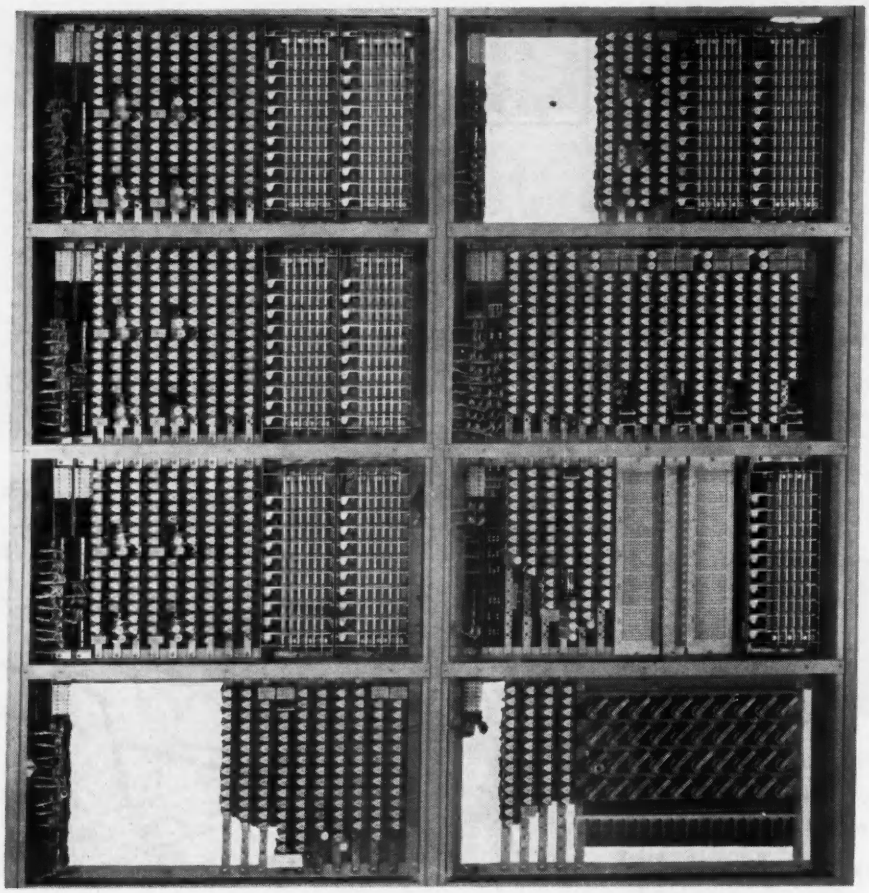

Layout for typical 90-line crossbar system showing standard module build up. Bay at left contains three Line Unit Modules, (each unit includes line finder and connector crossbar switches) and one control unit module for the three line units. Second bay includes — Selector Module, Originating Register Group Module, Number Group Module, and new Trans-O-ring Number Group Module. Not shown are the modules for the Incoming Register Group and Custom Trunk Unit (for intra-office repeaters) since these two are built to customer specification.

NEW PRODUCTS' SHOWCASE

By DICK REYNOLDS

North Electric Introduces New Switching Equipment

IN CELEBRATION of the 75th anniversary of North Electric Co., the unveiling of the Galion, Ohio manufacturer's newest switching equipment, NX-2 and NX-3 Modular Crossbar, was held in North's exhibit rooms at the 1959 USITA Convention.

According to North Electric's Vice President H. C. Ryon, "These new small crossbar systems will be of special interest to smaller operating companies who envision fast-growing nation-wide DDD patterns and are interested in economies in first cost as well as in future additions. We have included in our design all the provisions for the same efficiency, traffic handling capacity and flexibilities of our larger NX-1 Crossbar."

The new systems are designed to be compatible both economically and technically with the needs of Community Dial Offices in the range of 30 to 3000 lines. The wide range in capacity has been accomplished by the use of two different types of selector arrangements. The NX-3 Selector used in switchboards up to approximately 200 lines is a single stage arrangement, while the NX-2 Selector is arranged in two stages using the link connection principle. (See *Figure One.*)

The systems use registers for receiving, analyzing and storing of the dialed number, giving flexibility in numbering and greater simplicity of the switching circuits.

For calls terminating locally, the register stores the whole directory number. For calls directed to other offices, the register receives only the digital information necessary for the connection through the selector stage. Remaining digits are sent to the distant office under direct control of the subscriber's dial.

The switching stages consist of line finder, connector and selector, all using the same type of crossbar switches with 10 vertical and six horizontal bars. Basically, each vertical is used as a separate switch with 20 outlets as selector and 30 outlets as line finder and connector units. A method of grading verticals is used in order to obtain required multiple capacity.

The systems can be arranged for terminal-per-line (TPL) or terminal-per-station (TPS). In both cases the same type equipment and trunking is used with the exception of number group equipment which is added when terminal-per-station arrangement is required. According to the manufacturer this makes a conversion from TPL into TPS simple and economical. *Please turn to page 68*

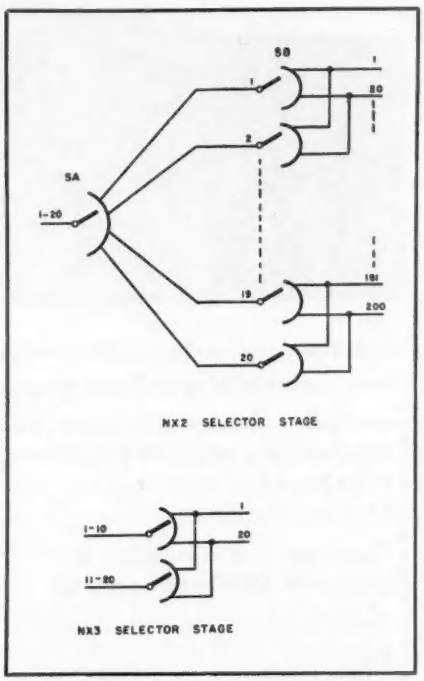

FIGURE ONE: — Difference between NX-2 and NX-3 Selector Stages.

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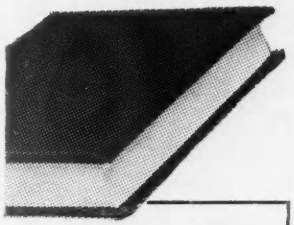

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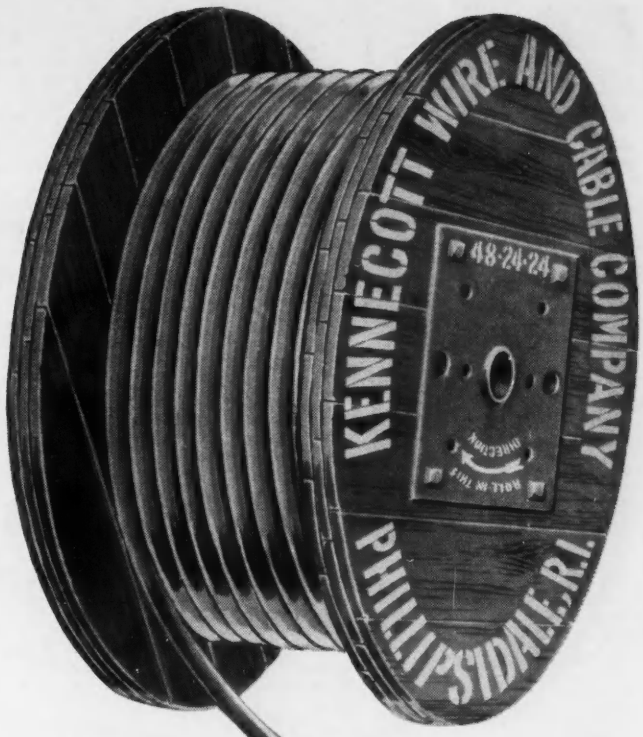

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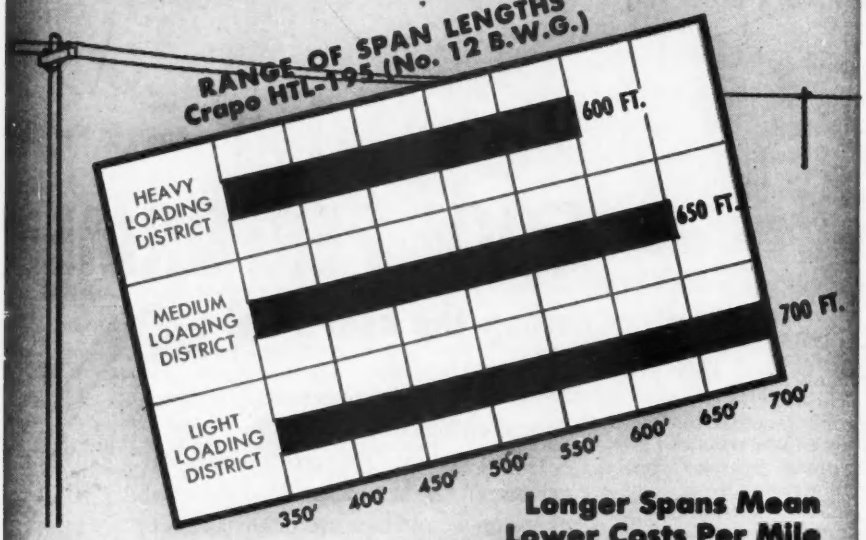

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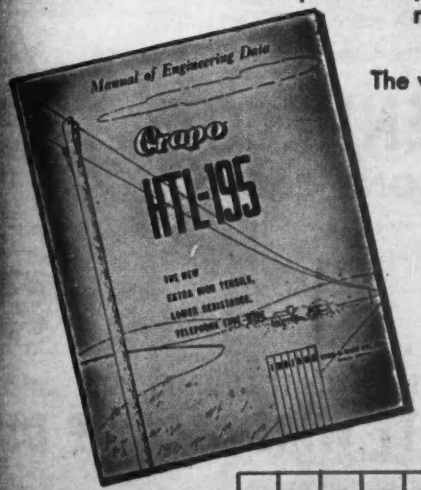

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The line finder and connector multiples have a maximum capacity of 90 lines per line group. The capacity is obtained by connecting three 30-line groups together. Switchboards not larger than 90 lines including trunks can be arranged without selectors by connecting line finders and connectors back to back.

Offices with more than one line group require a selector stage. This stage is expandable in increments of 20 outlets for the NX-3 system and in increments of 200 outlets when used in the NX-2 system. Either addition can be accomplished by adding pre-wired crossbar switch units on a parallel basis to the switching stage. This eliminates the necessity of introducing a second selector stage and rearrangement of existing grading and cross connections.

Other standard features in the systems are as follows: 10-party line service with full selective ringing; 100% lock-out; 15 PBX lines per 90 line group with no consecutive terminal arrangement required; unrestricted directory number assigments; full flexibility in relocating lines with single wire control; 100% automatic intercept; automatic reverting call identification by directory number; and modular design layout.

Figure Two shows a simplified trunking diagram of the NX-3 system. A call from a local line seizes the line finder control which is individual for the 90-line group. While identifying the calling line, the control selects an idle subscriber's originating trunk (SOT) associated with an idle originating register (REG-O). The control sets the line finder crossbar switch by operating two horizontals and a vertical associated with the selected SOT and with access to the calling line.

Register: — Upon seizure the REG-O sends dial tone to the line. By analyzing the first three digits (the office code) the REG-O determines whether the office code represents the local office or not. Recognizing the local office code, the register stores the remaining digits of the directory number.

Terminal-Per-Station: — If the

switchboard is arranged for terminal-per-station the number group is called in and the stored directory number is extended from the REG-O for translation into line number and party digit. How this is accomplished is described below.

Operation of Selector and Connector: — According to the line number, the proper connecting control as well as the selector control associated with the calling register are seized. From the number group and over a link arrangement the selector control receives the line group number and the connector control receives line number and party digit. The selector is operated to an idle subscriber's terminating trunk (STT) belonging to the line group to which the called line is connected. The connector control operates the connector switch setting a vertical associated with the selected STT in connection with the wanted line. The connection between the calling and the called line is completed by the operation of the SOT. This results in the release of REG-O, number group and the controls for the selector and connector stages.

Terminal-Per-Line: — A local to local call in a terminal-per-line office is handled similarly to what has been described for terminal-per-station except for the translation of the directory number. As the directory number in the TPL case is identical to the line number and party digit, selector and connector are seized by the REG-O as soon as the last digit of the dialed number has been received. The procedure from there on is identical with that of the TPS.

Outgoing Trunk Call: — If the register from the first dialed digits recognizes that the destination of the call is beyond the local office, the selector control is immediately seized. According to the route information from the register, the selector is set to an idle trunk. Upon switching of the calling line direct to the trunk the REG-O is disconnected and remaining digits sent to the distant office under direct control of the subscriber's dial.

Intercept: — Should the first dialed digits be a nonexisting code or for some other reasons restricted, the call is routed to manual or automatic intercept.

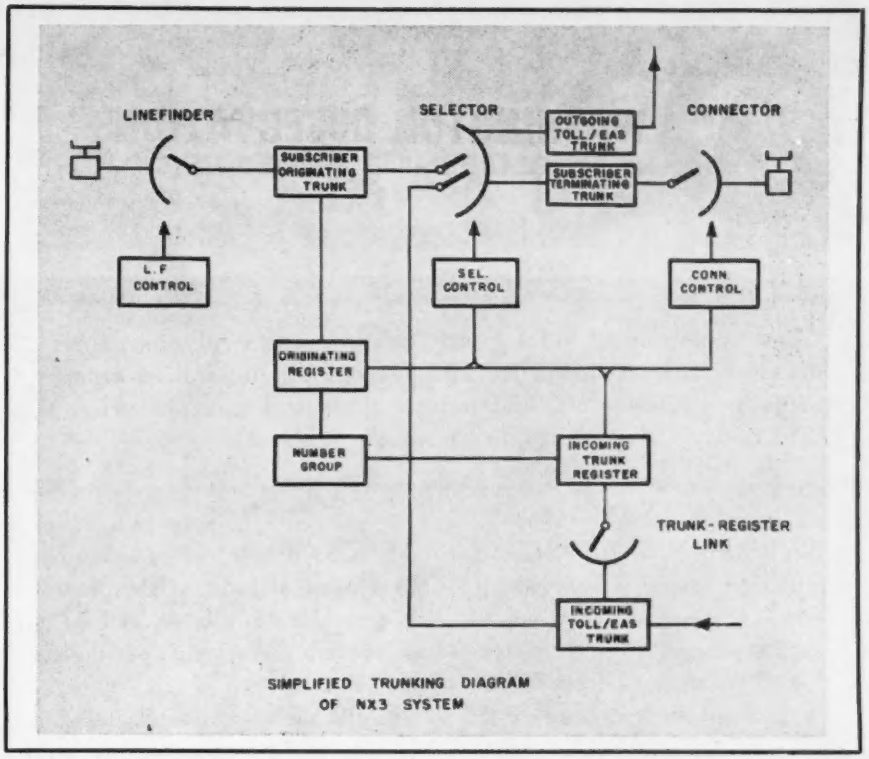

FIGURE TWO: — Simplified trunking diagram of the NX-3 system.

Incoming Trunk Call: — Incoming trunks have access to a group of incoming registers (REG-I) via the trunk register link (TRL). The connection of an incoming trunk to a REG-I is prepared ahead of time to avoid the loss of pulses should the first digit arrive short upon seizure. The procedure in terminating a call locally or to another trunk is hereafter similar to what has been described for calls originating in the line finder.

Transistorized Number Group: — The number group is arranged for 1000 directory number terminals. The translation from directory number into line number and party digit is accomplished by the use of ferrite core rings arranged in a jumper wire field. There are cores representing line group, tens, units and party digits.

The assignment of a directory number to a connector terminal is made by connecting a jumper wire to a directory number terminal and passing it through the rings representing line number and party. The wire is terminated on a common terminal block.

At the sending of a pulse through the wire an electronic reading device will respond and feed the required line and party information to the switching circuits.

A station can easily be relocated to another line or be directed to manual intercept by moving the single jumper wire. A complete removal of the wire will direct the call to automatic intercept.

Mechanical Design: — For mounting of relays and crossbar switches, a method has been used making it possible to compose standardized units or modules.

Crossbar switches and relay bars are mounted vertically in a frame 24⅝″ high by 46″ wide which also contains the fuse panel and equipment for test access. The modules are factory-wired and tested to the cross-connect terminal block, accessible both from front and rear.

A switchboard is composed of only a few types of standard and custom trunk modular units mounted in bays 8′ 4″ high by 8¾″ deep. A bay of this height contains four modules. Depending on required limits of height and floor space the bay can be made to accommodate three to five modules.

WASHINGTON OBSERVATIONS

by ROLAND DAVIES and FRED HENCK

√ Bell System and USITA jointly announce new toll compensation schedules providing for increases in 'A' function compensation in message toll, and new settlement plans for private line, Foreign Exchange Services.

NEW RECOMMENDED toll compensation schedules, estimated by the U. S. Independent Telephone Association to produce about $8,000,000 to $9,000,000 annually in added annual settlements for companies using average cents-per-message schedules, were jointly announced by USITA and the American Telephone & Telegraph Co. Friday, Oct. 9.

In addition to the changes in the "A" (all local functions used in long-distance service, with the exception of traffic operation) schedules for compensation to the Independents for interchanged message toll business, the two organizations also reported on new settlement plans for private line and foreign exchange services.

USITA said that the additional compensation accruing to the Independents from the application of the revised private line and foreign exchange schedules is expected to total somewhere between $500,000 and $750,000 a year.

The association said that "The total sum going to Independents in 1958 for settlements on interchanged message toll business was approximately $204,000,000. Taking into account the increase in toll messages and the revised schedules, the total amount accruing to our companies during the coming year should be substantially increased."

USITA said that the message toll agreement amounts to an annual increase of about $12,000,000 in message toll compensation, based on estimated 1959 overall toll traffic volumes. It said, however, that the actual total probably will be in the $8,000,000 to $9,000,000 area, because of the number of Independents that are on a special study basis, and do not use the average revenue per message schedules.

In the message toll schedules, no changes will be made in the "B" (traffic operator functions) schedules or in the line-haul prorates. The joint announcement on the message toll settlement said that "Industry representatives who have been reviewing the status of message toll settlements for jointly handled business agree that there have been changes in operating conditions since 1956, which can be reflected in average schedules for 'A' functions, without extensive restudy at this time of current operations. It was the consensus, however, that the industry is in need of additional study data with respect to Independent company automatic toll ticketing and line haul operations."

It said that the recommendations were arrived at "With the objective of introducing as promptly as possible those adjustments in average schedule settlements which are supportable without further detailed studies, and without prejudicing the position of either segment of the industry with respect to their views on separations procedures."

USITA's separations manual was delivered to the Washington office of the association early last month from the printer, and is now available for distribution to interested companies. It has been made clear in correspondence between Bell System and USITA representatives earlier, during the several months of negotiations which preceded last month's agreement, that there is a substantial difference of opinion between the two organizations on separations.

Message toll recommendations are: "That the revised 'A' schedules be introduced, to reflect overall changes in factors used in the 1956 studies — such as depreciation reserve, plant under construction, wages, and earnings — which have occurred subsequently.

"That these new 'A' schedules be offered to all companies using average schedules for settlement purposes. In other cases, such as whether settlements are on a special study basis or individual companies have agreed to a special study basis, the use of these schedules will be by mutual agreement between the companies involved.

"That the effective date for introduction of these revised schedules be the normal billing date in October, 1959, provided the individual Independent company accepts the Bell company offer to it within 30 days of the time the offer is made.

"That the industry undertake a cooperative study to determine the effects of Independent company automatic toll ticketing operations in lieu of manually handling message toll traffic. This would include the availability of data as to the relative costs of customer dialed toll calls and the remaining manually handled toll calls, where both functions are performed by an Independent company.

"That the industry undertake, as promptly as possible, the securing of data as to Independent line haul costs by types of plant used in handling joint business, having in mind the introduction by Independent companies of additional amounts of cable, carrier, and radio toll line plant since 1955. The objective of this project would be to test the possible need of modifications in average line haul schedules."

Under existing schedules, the "A" settlement per message where the average revenue per message is 10 to 10.5 cents is 9.4 cents for manual operation, and 10.5 cents for dial terminal per line and dial terminal per station. The new settlement amount is

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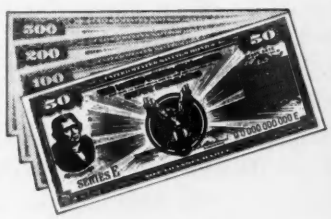

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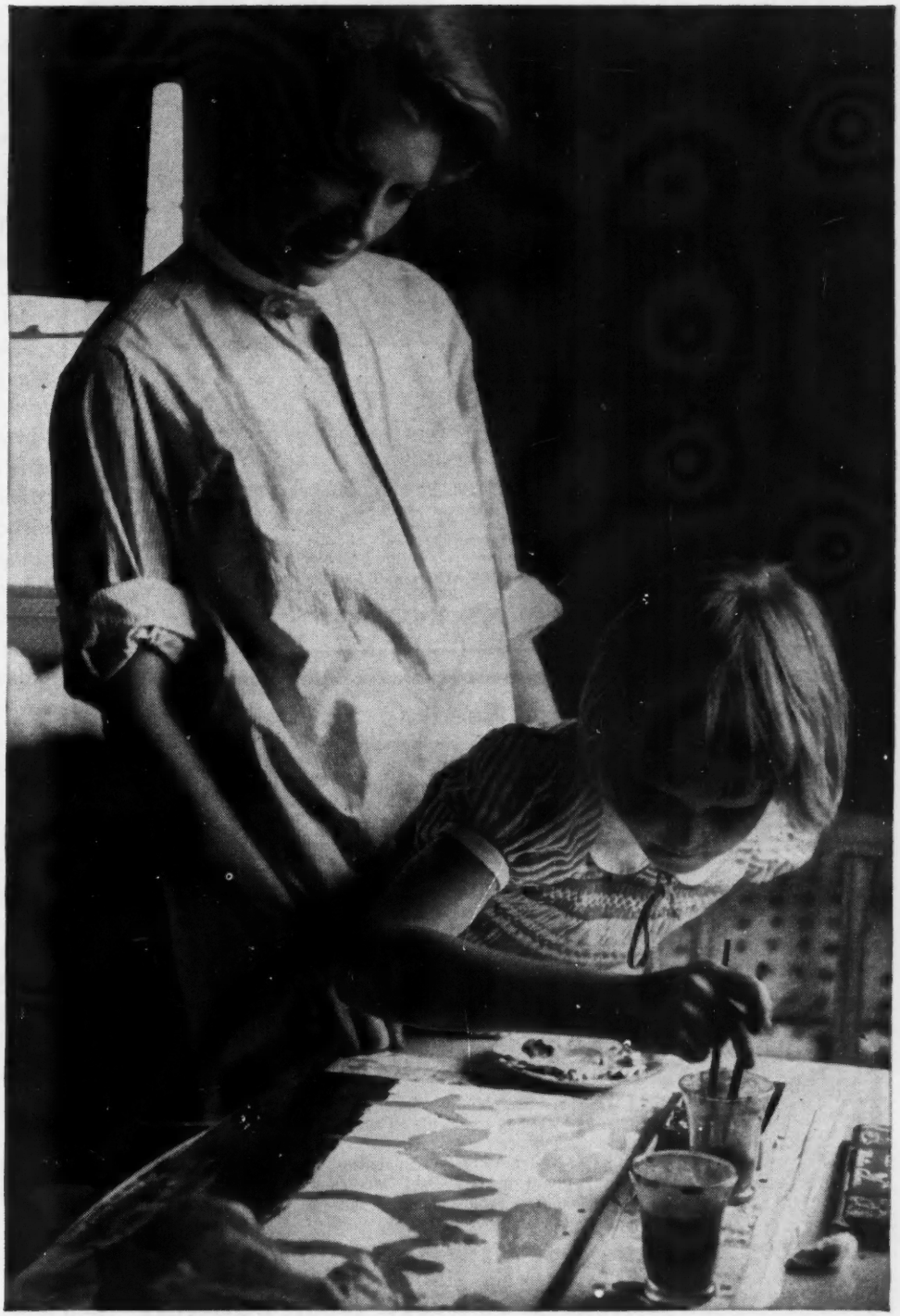

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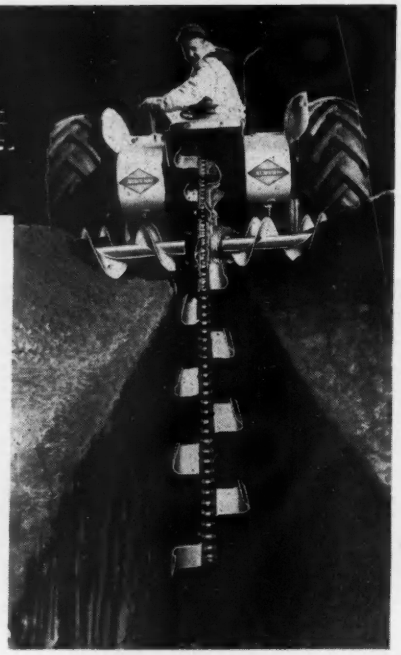

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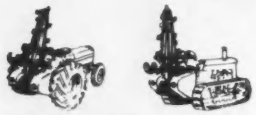

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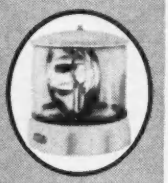

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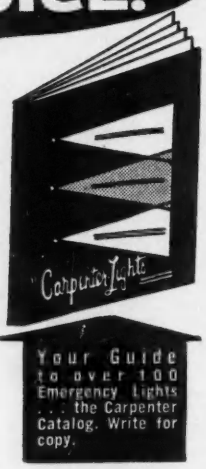

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Where the ARPM is 49.5 to 50 cents, present schedules call for 18.3, 19, and 20.6 cents, in the same order as above. The new schedule would be 20.2, 21.1, and 22.9 cents, respectively. At the top of the range, where the ARPM is $2.90-3.00, the present "A" schedule is 31.2, 37.1, and 37.1 cents respectively. The new recommended schedule is 34.2, 41.2, and 41.2 cents, respectively.

In the joint report on private line settlements, the Bell System and USITA representatives said the new schedules "would replace the 1937 plan, which no longer seems appropriate under present-day conditions."

The basic considerations underlying private line settlements, the report declared, include the point that "From a public relations standpoint, it is desirable that rates quoted for a private line service to be jointly furnished by a Bell and Independent company be the same to the extent practicable for each portion furnished. This will assure equitable treatment to all customers, promptness of quotation and otherwise facilitate the handling of the matter from the standpoint of both the customer and the telephone companies.

"Private line services utilize a variety of routes over various distances, some more and some less profitable than others, as in the case of message toll as well as other services furnished. Rates and charges for private line services established by the Bell companies tend to avoid the need for charging a customer for excess costs in specific cases, an opportunity not available to the Independents to the same extent because of the relatively limited area served and the small amount of private line facilities furnished by them.

"In rendering private line service with a Bell company, an Independent company may elect to participate by either (1) jointly using the Bell company rates and charges for the facilities provided for the joint service, or (2) establishing its own rates and charges based on its own revenue requirements.

"Where the Independent company

elects to join in the use of Bell company rates and charges, either through formal concurrence or informally, the Independent company should receive settlements based on costs, including a reasonable return, for the portion of the facilities it furnishes in providing the joint service.

"Where the Independent company establishes its own rates and charges for the facilities provided for the joint service, no settlements are involved. As a practical matter, however, the Independent company may wish to have the Bell company handle all the necessary details and arrangements for the service with the customer whose headquarters are in a Bell exchange."

The plan for private line services, not including SAGE and program services, calls for a $17.50 monthly settlement for each private line telephone grade local channel, including ordinary terminating equipment, and $20 for a local channel terminating in a private branch exchange switchboard. Also provided is a $10 monthly settlement for private line telegraph grade local channels.

For interexchange channel facilities provided by Independents to the point of connection with Bell company facilities, the settlement may be determined under schedules provided for, or by one of two alternatives, as follows:

"Use of the schedules where the private line utilizes existing message toll routes — and a study to develop the carrying charges for private line haul which requires new construction over new routes, provided these routes are used for private line service only.

"A study to determine the carrying charges on all of the inter-exchange circuit facilities, both private line and message toll, provided by the Independent company for joint services, including existing and new routes."

Where the Independent company elects to establish its own rates, the plan provides that the Independent company, or its Bell connecting company, should file the rates with the appropriate regulatory commission. The billing and collecting function would be handled by the Bell com-

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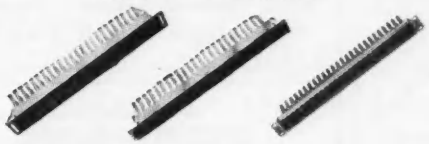

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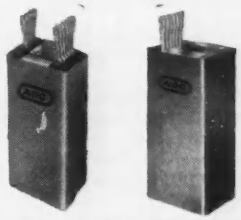
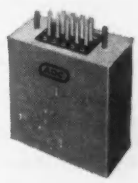


WE	ADC	WE	ADC
181B	A10129	307P	A10127
		139D	A9100



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pany, if the Independent desired, and no settlements would be involved, since the Independent would receive the charges made to the customer for its own facilities.

For telephone grade services, the Independent would receive an average settlement amount per route mile per month ranging from $3.25 per group for a one-circuit group, to $28.75 for a 10-circuit group, $54.30 for a 20-circuit group, and up to $125 for a 50-circuit group. Where telephone grade channels are used for services requiring better than normal transmission characteristics, such as certain telephotograph services, the settlement amount would be increased proportionately to the ratio between the telephotograph service rate and the full period private line telephone service rate.

Interexchange channel facilities used in telegraph grade private line services would be settled for, again applying an average settlement amount per route mile per month, from $3.25 for a one-circuit group to $14.35 for a 10-circuit group, $27.15 for a 20-circuit group, and up to $62.50 for a 50-circuit group.

For a short period private line service, the joint statement noted that "This type of service is fundamentally a prearranged message toll call between specified points for specified periods, time, and days; normal toll board connections and toll circuit facilities are used. In view of this, it seems appropriate that the settlement for any such jointly furnished services be made as a part of the regular message toll telephone settlements for each exchange involved."

In the joint report on foreign exchange service, the representatives of the two organizations "expressly" urged the "telephone industry to join in providing foreign exchange service where this meets the communication needs of its customers, and where this service is desired and requested."

Arrangements would be as follows: "The company in whose territory the customer is located — the 'local' company — reimburses the other company — the 'serving' company — for facilities and services furnished in providing the foreign exchange service as follows:

"(a) Where the foreign exchange service is provided through the use of exchange facilities on a cross-country basis, the 'serving' company's filed rates for the service furnished, less $1 for a residence service or $1.50 for a business service where the instrument is not provided by the 'serving' company.

"(b) Where the foreign exchange services is provided through the use of interexchange facilities — (1) the 'serving' company's filed rates for the exchange portion of the service it furnishes, less $3.50 for a residence service or $5 for a business service, since the instrument and the subscriber loop are not provided by the 'serving' company; (2) the 'serving' company's filed rates for the interexchange portion of the facilities it furnishes.

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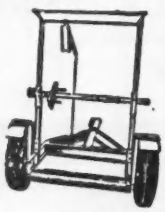

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These sets are equipped with No. 5-HA dials and Stromberg-Carlson No. D-2993 synchromonic ringers 30, 42, 54, and 66 cycles.

There are just 2500 of these sets available. We will sell "as removed from service" or reconditioned. Write or phone for prices today.

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C—Carrier Terminals
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(Also parts for above)

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12 Channel—X61822
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TH1/TCC-1 Terminals, Federal (speech plus duplex)
TG-30 Teleg. Repeaters—End
TG-31 Teleg. Repeaters—Intermediate
BD-100 Teleg. Switchboards

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RA-37 120VDC, SEL.
RA-87 120VDC, SEL.
RA-43 120VDC, Tube
Regulated Tube Types, W.E.
24, 120, 130 VDC
Battery Eliminators

TUBES, W. E.

#310-A Tubes, New
(Some others for use in above equipment)
Lamps, #A-1 (some others)
$16.00

SELECTORS, W. E.

60-AP, New	$25.00
162-C, selector sets	10.00
60-A, keys	2.00
70-A, Rep. Coils	5.00

RELAYS

one million in stock
(W.E., A.E., Kellogg, S.C., etc.)

SWITCHBOARDS

(hundreds in stock)
W. E. #12, New (CB & LB) — 5 Positions
(equipped as desired)
BD-110 (Signal Corps version of #12) with 15 univ. cd. ckts. (CB & LB) — 3 Positions
Many other Military types, also.
Kellogg CO manual boards, like new #—1600
PBX manual boards, like new K-100
Cordless, CB & LB, new
5 x 12 CB, new #1007CCX $150.00

DIAL PBX

North, all relay, PX-80
80 line (50 equipped) 7 link (6 equipped)
(complete with power supply, 48V)
12" x 51" x 81" overall, no provision for trunks.
A.E., Strowger switches, new, repeaters, relays.
(SAVE OVER ONE-HALF)

REPEATING COILS

(new)

W.E. 77A (substitute) C-161	$ 3.50
76A (two coils) 1:1 rat.	5.00
75A (better matched)	6.00
91A (double coil)	10.00
93A, B, F, G	12.50
70A ring-thru	5.00
27A non-ring-thru	3.00
25A two of above	5.00
94E non-ring-thru	2.50
94G	3.50
94H	5.00
101A	5.00
120C, CS, E, ES	5.00
Retard coils, 149E	3.00
Kellogg—New	
20A Repeating	$2.00
19A Repeating	2.50

FUSES, 35A, B, C, H, R, S. ..New, 10¢
($9 hund., $80 thousand) 75,000 in stock (standard W.E. pack, 10 or 50)

REPEATERS, VF

— Dry Line Type —
TP 14 (portable) 2-4 wire
12-18 DB gain (resp.)
—intermediate or end
Ring By-Passed
115-240 VAC—12 VDC
Mfg. by Federal, etc.
Moisture-proof wood case—removable for 19" rack mounting
11"x18"x8"—46 lbs.
$500.00 Value—New—$125.00
Like New—$100.00
Also W.E. 3 — Circuit Type — New

TEST EQUIPMENT

Plugs—Patchcords, W. E.
Jacks—Mountings
Complete Toll Test Boards

All New Material (unless otherwise noted) priced F.O.B. Los Angeles
Shipped on Approval — Satisfaction Guaranteed

The Telectric Co.

1218 VENICE BOULEVARD RIchmond 8-2249 LOS ANGELES 6, CALIFORNIA

FOR SALE

NO.	ITEM	PRICE
50	Dial manual pos-neg trunk CKTS (small) with repeat coils Stromberg-Carlson drawing S-11448	$40.00/ea.
507	Kellogg Dials for 1000 series (New)	2.00/ea.
300	Kellogg Dial plugs	.25/ea.
1200	Kellogg Ringers St. line	.50/ea.
22	Kellogg Ringers HB-2	3.00/ea.
90	Kellogg Ringers HB-3	3.00/ea.
90	Kellogg Ringers HB-4	3.00/ea.
68	Kellogg Ringers HB-5	3.00/ea.
375	A.E. Rec. cords CD 364064	.25/ea.
600	Kellogg Rec. cords KS 3000	.25/ea.
125	Kellogg Rec. cords KS 3004	.25/ea.
200	Kellogg Line Jacks, 10 and 20 per strip	4.00/strip
200	Kellogg Lamp strips, 10 and 20 per strip	2.50/strip
3000	Lamps and lamp caps	.10/ea.
6	Kellogg common battery switchboards, 5 freq. ringing 100 to 500 lines	4.00/line
1	Kellogg magneto switchboard 30 lines	4.00/line
200	Cook #100 C. O. Prot. 20 per strip	7.50/strip
6	Channels W-E "M" carrier	150.00/ea.

WE WILL SELL ANY OR ALL.
F.O.B. EDINBURG, VIRGINIA
Farmers' Mutual Tel. System
EDINBURG, VIRGINIA

FOR SALE

The following central office switchboards & telephones:

1, 100 line broad span Kellogg Relaymatic dial switchboard with selective ringing *$ 950.00*

1, Type 600 to 800 line Kellogg common battery switchboard with low key shelf and 600 lines installed, equipped with full decimonic ringing ..... *$ 450.00*

1, Floor type main distributing frame with run way from main frame to switchboard. The entire lot ..... *$ 100.00*

1, 30 line North CX dial switchboard equipped with one toll trunk, price ..... *$ 500.00*

1, 60 line North CX dial switchboard equipped with three composite toll trunks, price *$1000.00*

1, Lot approximately 800 type 1000, Kellogg telephones in working condition, a few of these telephones are equipped with dials. The entire lot at $3.00 each

Have approximately 150, 34A3B Automatic Electric type common battery telephones at $1.00 each.
All equipmt. F.O.B. Fayette, Ala.

ALABAMA TELEPHONE COMPANY
Fayette, Alabama

(Concluded from page 75)

charged to foreign exchange customers, the Independent company receives one half the full 'A' settlement, regardless of whether it is the local or serving company, in addition to the normal 'B' and line haul settlements where these are involved. This treatment is consistent with the settlement principle applied to collect, credit card, and third number calls." — *Roland Davies* & *Fred Henck.*

George Strichman Named Pres., Kellogg Switchboard

APPOINTMENT of George A. Strichman as president of Kellogg Switchboard & Supply Co., Chicago, Ill., communications division of International Telephone & Telegraph Corp., was announced October 9. He succeeds to a position that has been vacant since May.

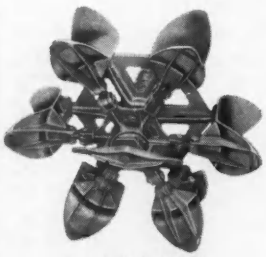
Strichman had been director of manufacturing services for the Raytheon Co. since June. His experience includes 11 years (1948-1956) with General Electric Co., where he was, successively, plant operations manager and reactor operations manager at the Knolls Atomic Power Laboratory, Schenectady, N. Y., and director of Manufacturing (1957-1959) for the Small Aircraft Engine Department, Lynn, Mass.

GEORGE STRICHMAN

Earlier, he had been associated with the Brown-Lipe-Chapin Division of General Motors Corp., Syracuse.

GENERAL MACHINE PRODUCTS COMPANY, INC.

Old Lincoln Highway at Pa. Turnpike, Trevose, Pa.



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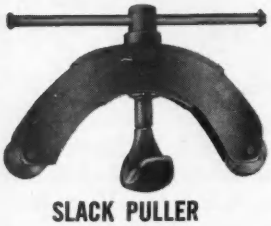

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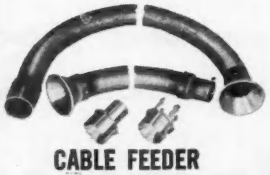

CABLE FEEDER

GMPCO

AERIAL TENTS
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CABLE BLOCKS
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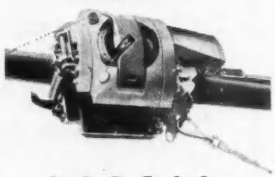
CLAMPS AND GRIPS
PORTABLE & POWER REELS

Distributed by GraybaR ELECTRIC COMPANY

PRESSURE TESTING KIT

COMPOUND



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Special Purpose Tools To Specifications — Catalog on Request

Over 600 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate shipment

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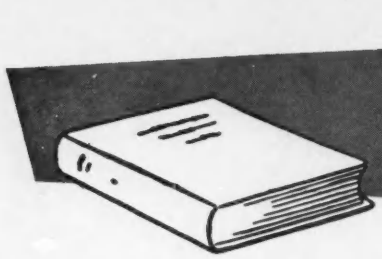


THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Circumstantial Evidence

MANY FOLKS have had an opportunity to make good use of an outdoor phone booth located along a highway or city street.

According to New Jersey Bell Tel-news, one chap gives a word of warning to fellow husbands, though: Better turn off your car radio before phoning your wife.

His wife read him the riot act because he was calling from "some juke box joint." After being chewed out in no uncertain terms, he finally realized that what she had heard was his car radio. So, for what it's worth, he passes his experience on to other wary husbands.

"But With a Difference"

MOST OF US have felt our hair stand on end at newspaper accounts of the escaped convict imprisoning a family in their own home and imperiling their lives, and a recent episode reported by the Associated Press had all the elements of this not unusual drama, but with a difference.

To an isolated farm near Dannemora, New York, came a 28-year-old inmate of the Dannemora Prison. The family had no reason to be frightened of him, though. He came to ask to use their telephone to contact, of all people, the prison warden! For he wasn't making a get-away at all — he had gotten lost while out in the woods with a work team!

A Good Buy

A SOUTHWESTERN Bell telephone slogan was knocked for a loop recently. No longer can they say, "*You can call any place in the United States after 6 p.m. for $2 or less.*"

Now that Texas is the second biggest state in the Union, things have changed: A call from the southern tip of Texas to Anchorage, Alaska, will set you back $6.75.

Nevertheless, taking into account the thousands of miles between the beaches along the Gulf of Mexico to the land of the northern lights, you do get your money's worth.

Kiddie Wonderland

TAKE SOME reels and poles and a peck of imagination and hard work, and first thing you know you'll have the best playground you ever saw.

When our Michigan correspondent told us this we were puzzled, and then he went on to explain what Michigan Bell had done in Detroit.

The company offered some discarded cable reels and telephone poles to Detroit's Department of Parks and Recreation, and, lo and behold, what a metamorphosis! Under the department's skillful planning the junked items were transformed into a Viking ship, a friendly dragon, picnic tables, gay parasols, a climb-around, a crow's nest and a cannon, as well as other strange and wondrous things.

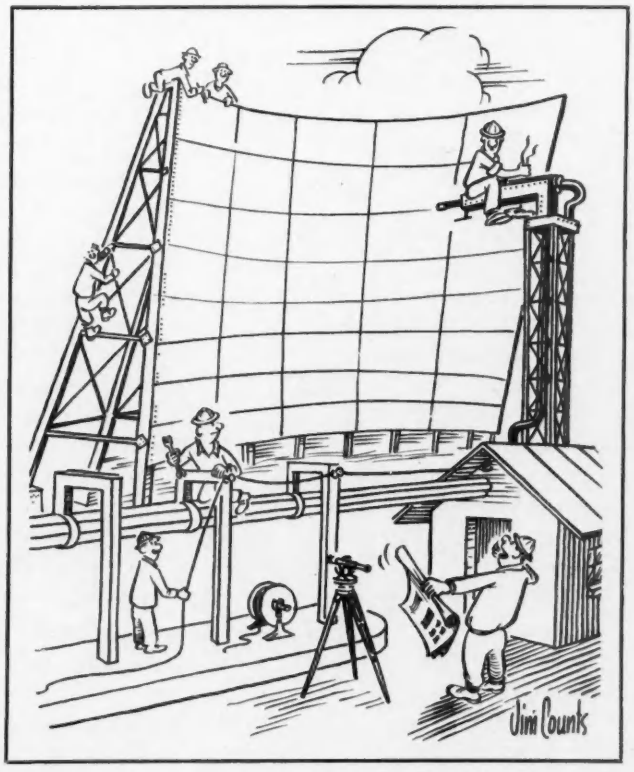
'Tis said you can't make something from nothing, but you come mighty close when you weave a wonderland out of discarded poles and reels!

"Call by Number"

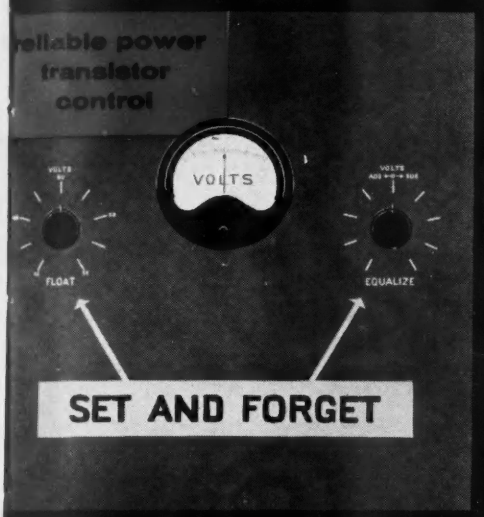
THE PROGRAM to get people to "call by number" on long distance calls brought forth an unusual response the other day.

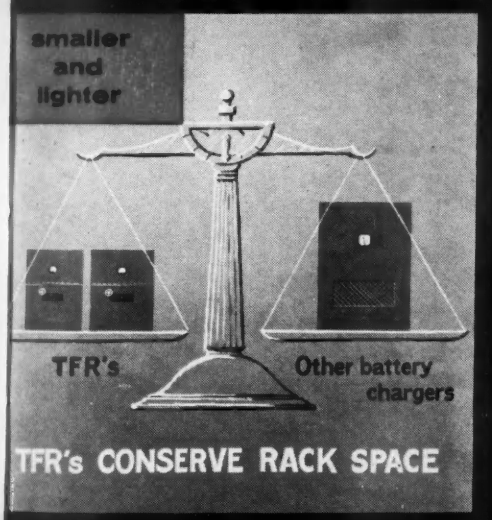
An operator was asked to place a call to a state prison official in Huntsville, Texas. "Do you know his number?" she asked.

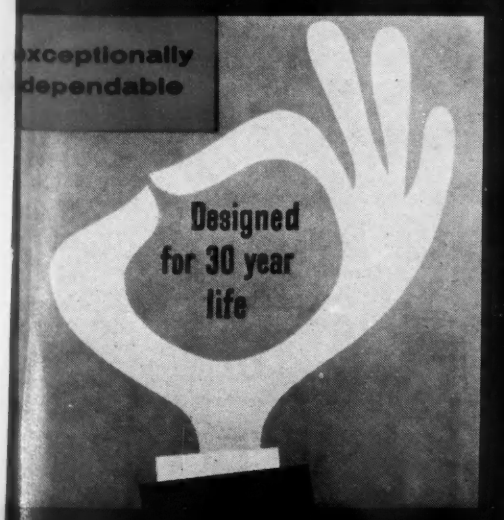
"He doesn't have a number," came the indignant reply. "He's the warden there."



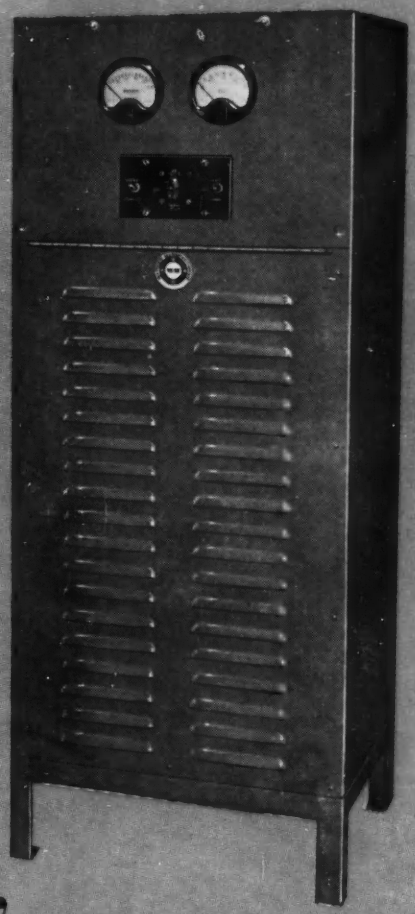
"Hold it men! . . . We've missed the beam! . . . We got to move the whole thing forty feet!"



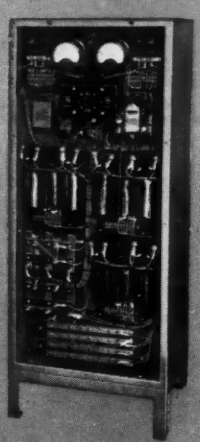




What you want most in battery chargers, you get in



WARREN TFR
TRANSISTOR FLOAT RECTIFIERS



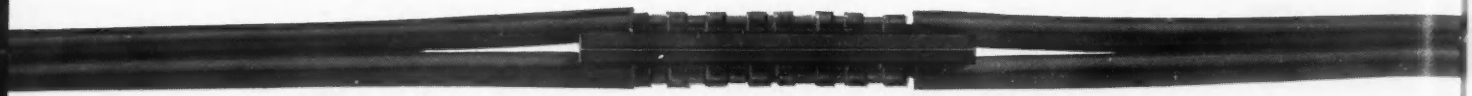
Warren TFRs are automatic, full-float, silicon-type battery chargers. Through reliable power transistor control, they provide precise voltage regulation, superior efficiency. The best in battery chargers, these compact, field-proved Transistor Float Rectifiers are available from 3 to 400 amperes. Specify Warren TFRs and you get what you want *most* in battery chargers... dependable, maintenance-free, adjustment-free performance.

Warren 100 ampere TFR (shown with cover removed): 45½" high, 23" wide, 15" deep; 685 pounds net weight. Write today for complete information.

THE WARREN MFG. COMPANY, INC.
LITTLETON, MASSACHUSETTS

WARREN MANUFACTURING WM

Shortest way to Short-proof splices...



Nicopress Splice Separators...

Ideal combination for full-strength, short-proof splices in parallel and twisted-pair wires... Nicopress Sleeves and Nicopress Splice Separators.

Nicopress Splice Separators save time, save tape, eliminate need for staggering splices, provide neater splices, eliminate shorts. Linemen readily make full-strength equal-tension splices in both parallel and twisted-pair conductors with Nicopress Sleeves and Tools, then merely snap the high-dielectric Nicopress Separator between the two splices. Tape is easy to apply over the insulated splices.

Nicopress Splice Separators are available in two sizes... 3456-B for both parallel and twisted-pair drop wire, and 3457-CD for rural distribution wire.

The National Telephone Supply Company

5100 SUPERIOR AVENUE • CLEVELAND 3, OHIO

Canadian Mfr.—N. SLATER CO., LTD., HAMILTON, ONT., CANADA

Export Distributor—INTERNATIONAL STANDARD ELECTRIC CORP., NEW YORK, N. Y.

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